Note: The two tabs on front of shield fit into slots at the top of the front panel.

8. Re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the EMI shield, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

7.2.15
LCD SCREEN CONTRAST ADJUSTMENT

The recommended tools for this procedure are as follows: small and medium flat-blade screwdrivers, No. 2 Phillips screwdriver, and 1/4 inch nutdriver.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To adjust the LCD screen contrast, refer to *Figure 7-6, Front Panel Assembly, Main PWA, and I/O PWA Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. Remove the EMI shield as described in *Section 7.2.14, EMI Shield Replacement.*
4. Position the infusion system on its base with the front of the infusion system facing the technician.
5. Locate the main PWA and potentiometer R1.
6. Using a small flat-blade screwdriver, turn the LCD adjustment screw to achieve optimum contrast of the LCD screen.
7. Re-assemble the infusion system in the exact reverse order of separation.

To verify the LCD screen contrast adjustment, inspect the contrast and perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

7.2.16
FRONT PANEL ASSEMBLY REPLACEMENT

The recommended tools for this procedure are as follows: No. 2 Phillips screwdriver, medium flat-blade screwdriver, 1/4 inch nutdriver, 5/32 inch nutdriver, X-acto knife, and long needle-nose pliers. A mild solvent is required if the touchswitch panel is to be removed and replaced.

The front panel assembly consists of the following components: LED display PWA, LCD assembly, and touchswitch panel. This section details the procedure for replacing the front panel assembly. Procedures for replacing the front panel assembly components follow.

Note: The front panel assembly must be removed in order to replace any front panel assembly component. In addition, the front panel assembly must be removed in order to access the main PWA or the I/O PWA.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the front panel assembly, refer to *Figure 7-6, Front Panel Assembly, Main PWA, and I/O PWA Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. Remove the EMI shield as described in *Section 7.2.14, EMI Shield Replacement.*
4. Using the long needle-nose pliers to support the ribbon cable, disconnect the ribbon cable ends that connect the main PWA to the LCD assembly. Gently pull the ribbon cable connector pins back and free from the main PWA.

   Note: Use caution when handling the ribbon cable and connector pins. A protective covering may be attached to the ribbon cable and to the solder side of the main PWA.

5. Disconnect the two-row connector (located at the bottom right of the LED display PWA) that connects to the main PWA by grasping the front panel assembly and pulling the left side clear of the mechanism assembly. Gently rock the front panel assembly until the LED display PWA is free from the connector.

   Note: Support the main PWA while disconnecting the LED display PWA.

6. Disconnect the front panel assembly from the infusion system.
7. At the I/O PWA, disconnect the ribbon cable connector joining the touchswitch panel to the I/O PWA.
8. Replace the front panel assembly in exact reverse order of removal. Prior to re-assembling the front and rear covers, connect the infusion system to AC (mains) power and verify successful completion of the self test.
9. Disconnect the AC (mains) power, then re-assemble the front and rear covers in the exact reverse order of separation.

To verify successful replacement of the front panel assembly, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

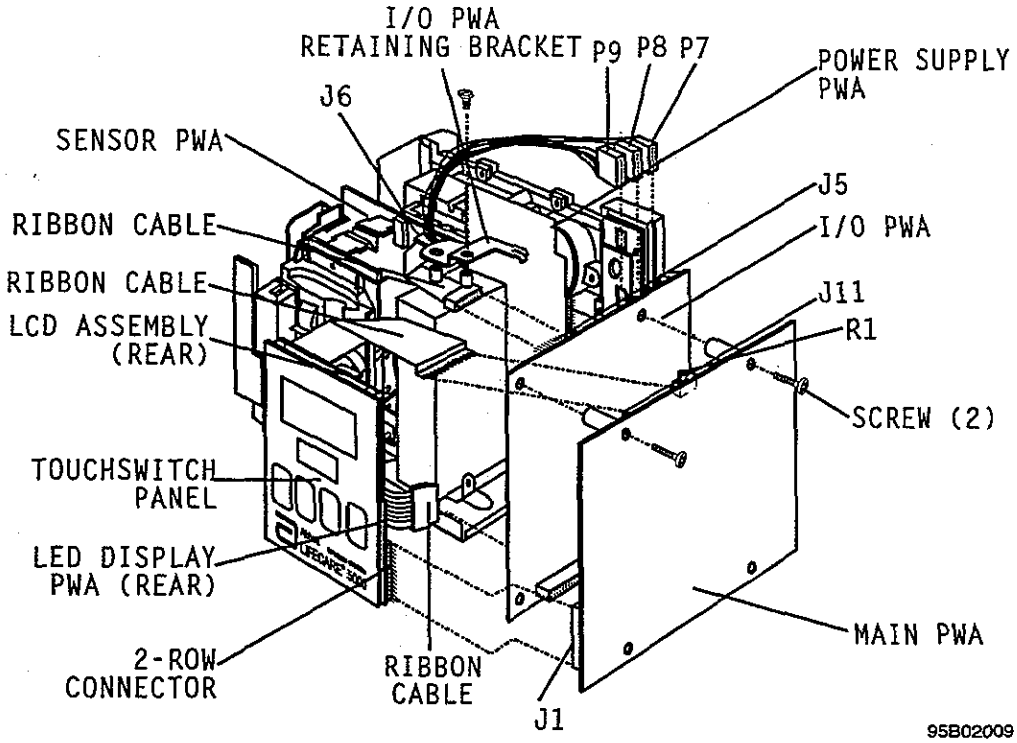


Figure 7-6. Front Panel Assembly, Main PWA, and I/O PWA Replacement

7.2.16.1

LED DISPLAY PWA REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the LED display PWA, refer to *Figure 7-6, Front Panel Assembly, Main PWA, and I/O PWA Replacement,* then proceed as follows:

1. Remove the front panel assembly as described in *Section 7.2.16, Front Panel Assembly Replacement.*
2. Using a 1/4 inch nutdriver, remove the three hex locknuts from the LED display PWA. Set the hex locknuts aside for re-assembly. Remove the clear acetate insulator and set aside for re-assembly.
3. Lift the LED display PWA from the studs and disconnect the two-pin connector that connects the LED display PWA to the LCD assembly. Set the nylon spacers, located under the LED display PWA, aside for re-assembly.
4. Replace the LED display PWA. Reconnect all cables and wire harnesses. Connect the infusion system to AC (mains) power to verify the self test successfully completes.
5. Disconnect AC (mains) power. Replace the LED display PWA on studs and spacers in the exact reverse order of removal. Verify the two-pin connector wires are retained in the insulator loop retainer.
6. Replace the front panel assembly in the exact reverse order of disassembly.
7. Re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the LED display PWA, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

7.2.16.2

LCD ASSEMBLY REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the LCD assembly, refer to *Figure 7-6, Front Panel Assembly, Main PWA, and I/O PWA Replacement,* then proceed as follows:

1. Disassemble the infusion system as described in *Section 7.2.16.1, LED Display PWA Replacement,* Step 1 through Step 3. Verify the two-pin connector is removed from the LED display PWA.
2. Using a 5/32 inch nutdriver, remove the four hex nuts and lockwashers securing the LCD assembly to the LED display PWA. Set the hex nuts and lockwashers aside for re-assembly.
3. Lifting the LCD assembly from the studs, set the spacers aside for re-assembly, then remove and replace the LCD assembly.
4. Reconnect all headers, cables, and wire harnesses. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
5. Disconnect AC (mains) power. Replace the LCD assembly on studs and spacers.
6. Using a 5/32 inch nutdriver, replace the four hex nuts and lockwashers securing the LCD assembly to the LED display PWA. Verify that the two-pin connector is reconnected to the LED display PWA and that LED display PWA is secured.
7. Re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the LCD assembly PWA, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

7.2.16.3

TOUCHSWITCH PANEL REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the touchswitch panel, refer to *Figure 7-6, Front Panel Assembly, Main PWA, and I/O PWA Replacement,* then proceed as follows:

1. Remove the front panel assembly as described in *Section 7.2.16, Front Panel Assembly Replacement.*
2. Using an X-acto knife with a round blade, pry the touchswitch panel loose from the front panel.
3. Using a mild solvent, remove adhesive residue from the front panel and dry thoroughly.
4. Replace the touchswitch panel; remove the protective paper backing, then carefully center the touchswitch panel on the front panel surface and press into place.
5. Connect the infusion system to AC (mains) power and verify successful completion of the self test. Disconnect AC (mains) power.

6. Replace the front panel assembly in the exact reverse order of disassembly.

To verify successful replacement of the touchswitch panel, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

7.2.17

MAIN PWA AND I/O PWA REPLACEMENT

The recommended tools for this procedure are as follows: medium flat-blade screwdriver, No. 2 Phillips screwdriver, 1/4 inch nutdriver, and long needle-nose pliers.

To replace the main PWA or the I/O PWA, proceed as follows:

7.2.17.1

MAIN PWA REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the main PWA, refer to *Figure 7-6, Front Panel Assembly, Main PWA, and I/O PWA Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.* Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement,* and the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement.*
3. Using a No. 2 Phillips screwdriver, remove the screws and lockwashers securing the I/O PWA to the main PWA. Set the screws and lockwashers aside for re-assembly.
4. Using a slight rocking motion, gently pull the main PWA from the infusion system side to disconnect the main PWA from the I/O PWA 40-pin connector (located at I/O PWA bottom) and the LED display PWA two-row connector.
5. Remove and replace the main PWA. Reconnect all cables, headers, and wire harnesses in exact reverse order of removal.
6. Connect the infusion system to AC (mains) power and verify successful completion of the self test. Disconnect AC (mains) power.
7. Replace the front panel assembly and EMI shield in exact reverse order of removal.
8. Re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the main PWA, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

7.2.17.2

I/O PWA REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

Note: The nurse-call jack, DIP switches and cover, audible alarm level switch, and flow detector jack are integral components of the I/O PWA. In 1.6 series infusion systems with DataPort accessory cables, a DB-15 interface connector is also included on the I/O PWA. The location of the DIP switch cover on the recessed I/O port panel varies according to the presence or absence of the Dataport connector.

To replace the I/O PWA, refer to *Figure 7-6, Front Panel Assembly, Main PWA, and I/O PWA Replacement*, then proceed as follows:

1. As described in *Section 7.2.13, Separating the Front and Rear Covers*, separate the front and rear covers. Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement*, and the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement*.
2. Using a 1/4 inch nutdriver, remove the screw securing the I/O PWA retaining bracket. Remove the retaining bracket. Set the retaining bracket and screw aside for re-assembly.
3. Using a slight rocking motion, remove the ribbon cable connecting the main PWA to the LED display PWA.
4. Using a No. 2 Phillips screwdriver, remove the screws and lockwashers securing the I/O PWA to the main PWA. Set the screws and lockwashers aside for re-assembly. Separate the main PWA from the I/O PWA.
5. Using a slight rocking motion, gently pull out the 40-pin, 2-row, right-angle connector connecting the I/O PWA to the power supply PWA. At the top of the I/O PWA, disconnect the ribbon cable connecting the I/O PWA to the sensor PWA. Pull the I/O PWA from the infusion system, removing the I/O panel connectors from panel cutouts.

   Note: Mark mating reference designations to facilitate reconnection.

6. At the top of the I/O PWA, disconnect the motor cable plugs P7 through P9. Remove the I/O PWA and record the DIP switch settings. Insert the replacement I/O PWA. Reconnect all cables, headers, and wire harnesses in the exact reverse order of removal.
7. Connect the infusion system to AC (mains) power. Load a primed cassette into the cassette door and close the cassette door. Verify the successful completion of the self test. Open the cassette door. Disconnect the infusion system from AC (mains) power.
8. Replace the front panel assembly and EMI shield in the exact reverse order of removal. Re-assemble the infusion system in the exact reverse order of disassembly.
9. Using a No. 2 Phillips screwdriver, remove the screw from the DIP switch cover. Remove the cover to expose the DIP switches. Set the DIP switches to the macro (single channel) configuration (*refer to Figure 1-1, DIP Switch Settings for Each Delivery Mode*).
10. With the cassette loaded, close the cassette door. Verify the delivery mode displayed on the LCD screen corresponds to the DIP switch setting LCD display listed in *Figure 1-1*. Open the cassette door.
11. Set the DIP switches to the next delivery mode configuration listed in *Figure 1-1*. Repeat Step 10 until all delivery modes are tested.
12. Set the DIP switches to the delivery mode configuration recorded in Step 6.

To verify successful replacement of the I/O PWA, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series)*.

7.2.18

POWER SUPPLY PWA AND MECHANISM ASSEMBLY REPLACEMENT (1.5 SERIES)

The recommended tools for this procedure are as follows: medium flat-blade screwdriver, No. 2 Phillips screwdriver, 1/4 inch nutdriver, 3/16 inch nutdriver, 5/32 inch nutdriver, X-acto knife, and needle-nose pliers.

The procedures in this section apply only to infusion systems with 1.5 series software. For 1.6 series infusion systems, refer to *Section 7.2.19, Power Supply PWA, Mechanism Assembly, and Battery Charger PWA Replacement (1.6 Series).*

7.2.18.1

POWER SUPPLY PWA REPLACEMENT (1.5 SERIES)

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the power supply PWA, refer to *Figure 7-7, Mechanism Assembly, Power Supply PWA, and Battery Charger PWA Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.* Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement.* Remove the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement.* Remove the main PWA and I/O PWA as described in *Section 7.2.17.2, I/O PWA Replacement.*
3. Place the infusion system face down on a soft surface with base facing technician.
4. Using a 3/16 inch nutdriver, remove the five closely grouped hex-head screws securing the power supply PWA to the chassis bottom. Set the screws aside for re-assembly.
5. Place infusion system upright on its base.
6. Disconnect the connectors from J16, J17, and J18. Disconnect connectors P1 and P2 to the battery boost PWA, if installed.

   Note: Confirm that all cables and wires are moved away from the power supply PWA.

7. Viewing the infusion system from the main PWA side, grasp the top of the power supply PWA and lift it slightly, tilting the top toward the power transformer. Slide the power supply PWA out toward main PWA.
8. Remove and replace the power supply PWA. Reconnect all cables, headers, and wire harnesses in exact reverse order of removal.
9. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
10. Disconnect AC (mains) power. Replace the front panel assembly and EMI shield in exact reverse order of removal. Join the front and rear covers in exact reverse order of separation.
11. Re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the power supply PWA, perform the PVT as described in *Section 5.2.*

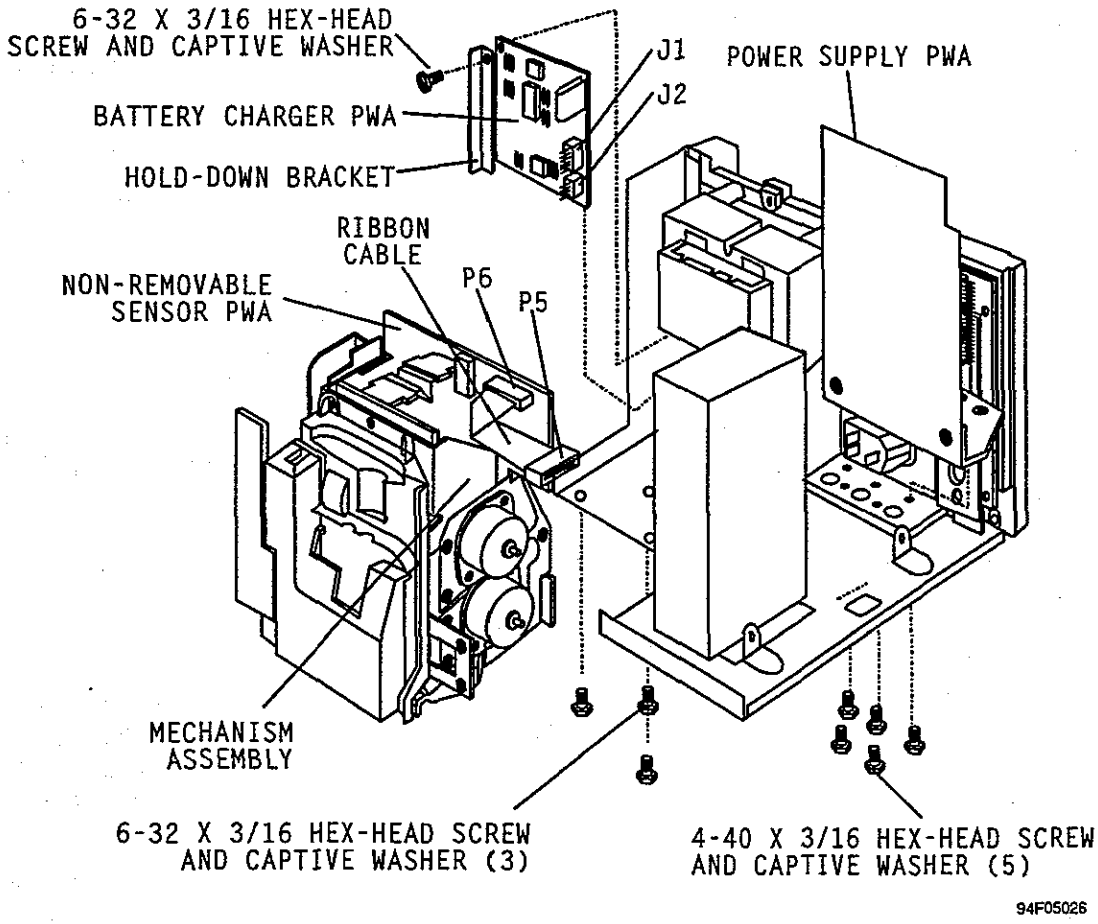


Figure 7-7. Mechanism Assembly, Power Supply PWA, and Battery Charger PWA Replacement

7.2.18.2

MECHANISM ASSEMBLY REPLACEMENT (1.5 SERIES)

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

Note: The mechanism assembly includes the bubble sensor PWA, the sensor PWA, and the pumping mechanism. This entire assembly is field-replaceable only as a single unit.

To replace the mechanism assembly, refer to *Figure 7-7, Mechanism Assembly, Power Supply PWA, and Battery Charger PWA Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.* Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement,* and the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement.*

3. Using a 1/4 inch nutdriver, remove the three closely grouped hex-head screws securing the mechanism assembly to the chassis bottom. Support the mechanism assembly until all three screws are removed. Set the screws aside for re-assembly.

   Note: Two screws are located just under the cassette door; the third is toward the infusion system rear.

4. Remove and replace the mechanism assembly.
5. Using a 1/4 inch nutdriver, replace the three hex-head screws securing the mechanism assembly to the chassis bottom. Support the mechanism assembly until all three screws are replaced.
6. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
7. Disconnect AC (mains) power, then re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the mechanism assembly, perform the PVT as described in *Section 5.2.*

7.2.19

POWER SUPPLY PWA, MECHANISM ASSEMBLY, AND BATTERY CHARGER PWA REPLACEMENT (1.6 SERIES)

The recommended tools for this procedure are as follows: medium flat-blade screwdriver, No. 2 Phillips screwdriver, 1/4 inch nutdriver, 3/16 inch nutdriver, 5/32 inch nutdriver, X-acto knife, and needle-nose pliers.

The procedures in this section apply to infusion systems with 1.6 series software only. For infusion systems with 1.5 series software, refer to *Section 7.2.18, Power Supply PWA and Mechanism Assembly Replacement (1.5 Series).*

Note: If a defective battery charger PWA is to be replaced, the mechanism assembly must first be removed.

7.2.19.1

POWER SUPPLY PWA REPLACEMENT (1.6 SERIES)

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the power supply PWA, refer to *Figure 7-7, Mechanism Assembly, Power Supply PWA, and Battery Charger PWA Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.* Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement.* Remove the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement.* Remove the main PWA and I/O PWA, as described in *Section 7.2.17.2, I/O PWA Replacement.*

3. Place the infusion system face down on soft surface with base facing technician.
4. Using a 3/16 inch nutdriver, remove the five closely grouped hex-head screws securing the power supply PWA to the chassis bottom. Set screws aside for re-assembly.
5. Place infusion system upright on its base.
6. Disconnect the connectors from J16, J17, and J18. Disconnect connectors P1 and P2 to the battery boost PWA.

   Note: Confirm that all cables and wires are moved away from power supply PWA.

7. Using the needle-nose pliers, disconnect the power supply PWA harness connectors from J1 and J2 on the battery charger PWA.
8. Viewing the infusion system from the main PWA side, grasp the top of the power supply PWA and lift it, tilting the top toward the power transformer. Slide power supply PWA out toward the main PWA.
9. Remove and replace the power supply PWA. Reconnect all cables, headers, and wire harnesses in exact reverse order of removal.
10. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
11. Disconnect the infusion system from AC (mains) power. Replace the front panel assembly and EMI shield in exact reverse order of removal
12. Re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the power supply PWA, perform the PVT as described in *Section 5.3.*

7.2.19.2

MECHANISM ASSEMBLY REPLACEMENT (1.6 SERIES)

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

Note: The mechanism assembly includes the bubble sensor PWA, the sensor PWA, and the pumping mechanism. This entire assembly is field-replaceable only as a single unit.

To replace the mechanism assembly, refer to *Figure 7-7, Mechanism Assembly, Power Supply PWA, and Battery Charger PWA Replacement,* then proceed as follows:

1. Disconenct the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.* Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement* and the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement.*
3. Using a 1/4 inch nutdriver, remove the three closely grouped hex-head screws securing the mechanism assembly to the chassis bottom. Support the mechanism assembly until all three screws are removed. Set the screws aside for re-assembly.

   Note: Two screws are located just under the cassette door; the third is toward the infusion system rear.

4. Remove and replace the mechanism assembly.
5. Using a 1/4 inch nutdriver, replace the three hex-head screws securing the mechanism assembly to the chassis bottom. Support the mechanism assembly until all three screws are replaced.
6. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
7. Disconnect AC (mains) power, then re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the mechanism assembly, perform the PVT as described in *Section 5.3.*

7.2.19.3

BATTERY CHARGER PWA REPLACEMENT (1.6 SERIES)

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the battery charger PWA, refer to *Figure 7-7, Mechanism Assembly, Power Supply PWA, and Battery Charger PWA Replacement,* then proceed as follows:

1. Disconnect AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.* Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement.* Remove the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement.* Remove the mechanism assembly as described in *Section 7.2.19.2, Mechanism Assembly Replacement (1.6 Series).*
3. Using a 3/16 inch nutdriver, remove the hex-head screws securing the hold-down bracket to the infusion system chassis. Set the screws and bracket aside for re-assembly.
4. Remove and replace the battery charger PWA.
5. Using a 3/16 inch nutdriver, replace the hex-head screws securing the hold-down bracket to the infusion system chassis.
6. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
7. Disconnect AC (mains) power. Replace the front panel assembly and EMI shield in exact reverse order of removal.
8. Disconnect AC (mains) power, then re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful replacement of the battery charger PWA, perform the PVT as described in *Section 5.3.*

7.2.20

DOOR HANDLE REPLACEMENT

The recommended tools for this procedure are as follows: No. 2 Phillips screwdriver and medium flat-blade screwdriver.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the door handle, refer to *Figure 7-8, Door Handle and Door Mechanism Leaf Spring Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. With the cassette door closed, use a No. 2 Phillips screwdriver to remove the two Phillips-head screws securing the door handle to the door mechanism.
4. Open the cassette door and remove a third Phillips-head screw. Remove the door handle.
5. Replace the door handle in exact reverse order of removal.
6. Open and close the door handle several times to confirm that it is operational.
7. Re-assemble infusion system covers, battery pack connectors, and cover in the exact reverse order of removal.

To verify successful replacement of the door handle, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

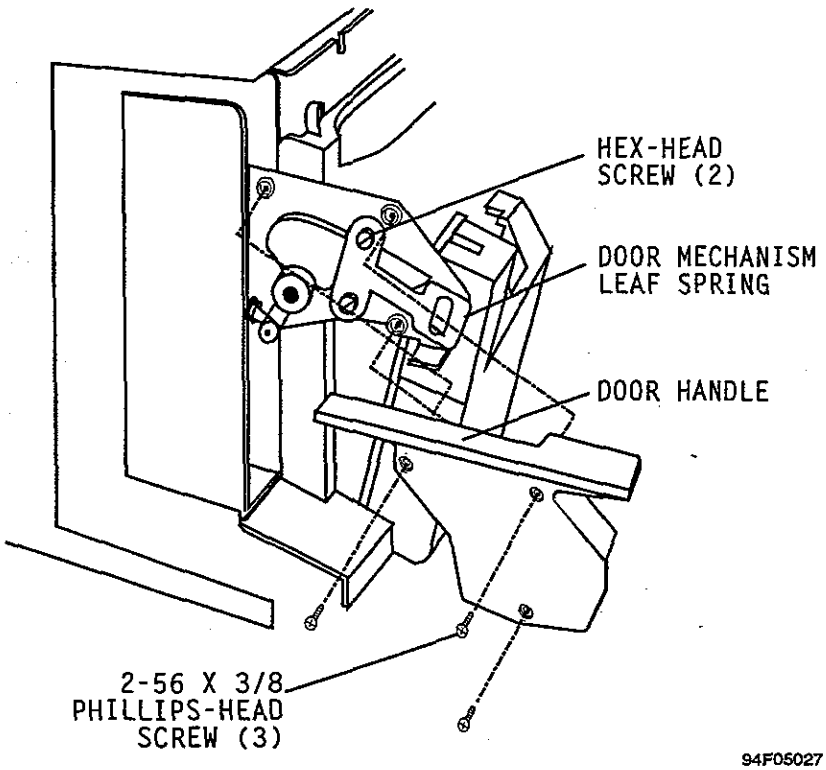


Figure 7-8. Door Handle and Door Mechanism Leaf Spring Replacement

7.2.21
DOOR MECHANISM LEAF SPRING REPLACEMENT

The recommended tools for this procedure are as follows: 3/16 inch nutdriver or medium flat-blade screwdriver, and No. 1 Phillips screwdriver.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the door mechanism leaf spring, refer to *Figure 7-8, Door Handle and Door Mechanism Leaf Spring Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers, as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. With the cassette door closed, use a No. 2 Phillips screwdriver to remove the two Phillips-head screws securing the door handle to the door mechanism.
4. Open the cassette door and remove a third Phillips-head screw. Remove the door handle.
5. Using a 3/16 inch nutdriver or medium flat-blade screwdriver, remove the two hex-head screws securing the door mechanism leaf spring to the door mechanism. Set the screws aside for re-assembly. Remove the door mechanism leaf spring.
6. Replace the door mechanism leaf spring in the exact reverse order of removal.
7. Open and close the door handle several times to confirm that it is operational.
8. Re-assemble infusion system covers, battery pack connectors, and cover in the exact reverse order of removal.

To verify successful replacement of the door mechanism leaf spring, perform the PVT as described in *Section 5.2 (1.5 series) or Section 5.3 (1.6 series).*

7.2.22
CASSETTE LOADING LEAF SPRING REPLACEMENT

The recommended tool for this procedure is a small flat-blade screwdriver.

To replace the cassette loading leaf spring, refer to *Figure 7-9, Cassette Loading Leaf Spring Replacement,* then proceed as follows.

1. Disconnect the infusion system from AC (mains) power.
2. Lift the door handle. Compress the door retainer leaf spring and pull down cassette door assembly.
3. Using a small flat-blade screwdriver, remove the two screws securing the cassette loading leaf spring to the door assembly. Remove the cassette loading leaf spring.
4. Replace the cassette loading leaf spring by guiding the two locator pins on the bottom of the cassette loading leaf spring into the slotted holes on the cassette door assembly. Position the leaf spring to align the screw holes.
5. Using a small flat-blade screwdriver, replace the two screws securing the leaf spring to the door assembly.
6. Compress the door retainer leaf spring and lift cassette door assembly into the locked position. Close the door handle to secure the door.

To verify successful replacement of the cassette loading leaf spring, perform the PVT as described in *Section 5.2 (1.5 series) or Section 5.3 (1.6 series).*

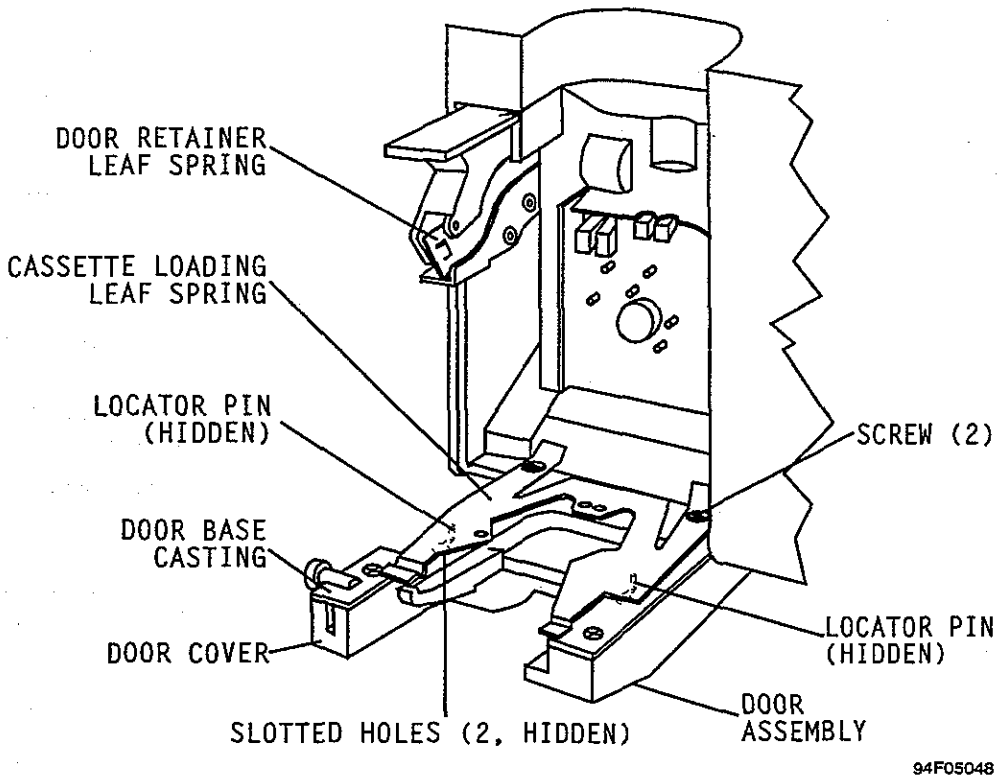


Figure 7-9. Cassette Loading Leaf Spring Replacement

7.2.23

DOOR ASSEMBLY REPLACEMENT

The recommended tools for this procedure are as follows: No. 1 Phillips screwdriver, No. 2 Phillips screwdriver, small flat-blade screwdriver, medium flat-blade screwdriver, 1/4 inch nutdriver, and grease.

This procedure details replacing the door assembly. Replacement of the door assembly components follow.

Note: Replace the door assembly only if the entire assembly is defective.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the door assembly, refer to *Figure 7-10, Door Assembly Replacement*, then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers, as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. Using a 1/4 inch nutdriver, remove the two hex-head screws located on the cassette door shaft.
4. Place the infusion system on its back. Grasping the cassette door, pull up on the door handle and remove the door assembly.

5. Place the infusion system upside down with the infusion system front facing the technician and the door handle in the open position.
6. Install the replacement door assembly with the door assembly cover facing the technician. Verify the flat side of the cassette door shaft is facing up and the shaft is centered with the shaft hole. Position the cassette door shaft in the infusion system frame shaft cradle. Verify the door base casting ball bearing snaps into position behind door retainer leaf spring.
7. Align the cassette door shaft screw holes with the cradle screw holes.
8. Using a 1/4 inch nutdriver, replace the two hex-head screws located on the cassette door shaft.
9. Re-assemble the front and rear covers in the exact reverse order of disassembly.

To verify successful replacement of the door assembly, perform the PVT as described in *Section 5.2, (1.5 series)* or *Section 5.3, (1.6 series).*

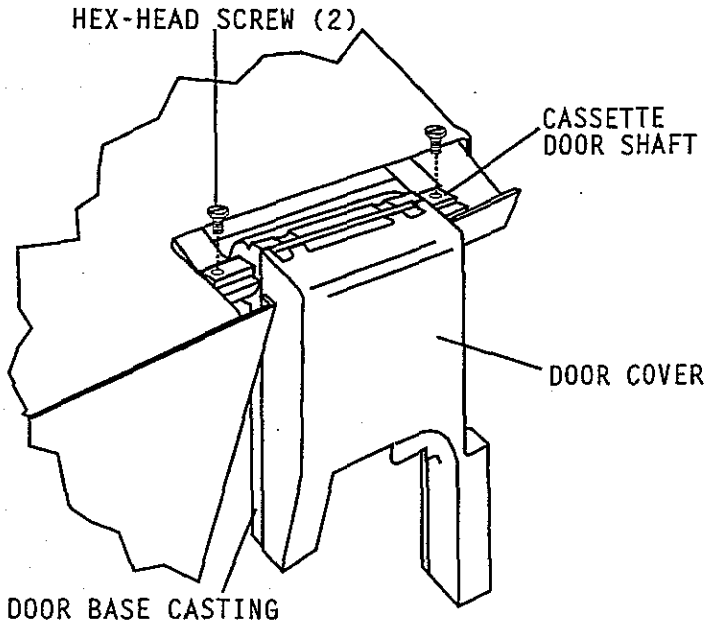


Figure 7-10. Door Assembly Replacement

7.2.23.1

DOOR COVER REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the door cover, refer to *Figure 7-11, Door Assembly Parts Replacement*, then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate front and rear covers, as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. Using a 1/4 inch nutdriver, remove the two hex-head screws securing the door hinge loading spring to the door base casting.
4. Place the infusion system on its back. Grasping the cassette door, pull up on the door handle and remove the door assembly.
5. Using a No. 1 Phillips screwdriver, remove the four Phillips screws from the door base casting. Separate the door cover from the door base casting.
6. Replace the door cover by guiding the door base casting into the door cover cavity.
7. Using a No. 1 Phillips screwdriver, replace the four Phillips screws in the door base casting.

   CAUTION: Do not over tighten the screws. Overtightening may strip screw threads.

8. Place the infusion system upside down with the front of the infusion system facing the technician and the door handle open.
9. Install the door assembly with the door assembly cover facing the technician. Confirm the flat side of the cassette door shaft is facing up and the shaft is centered within the shaft hole. Place the cassette door shaft into the infusion system frame shaft cradle. Confirm the door base casting ball bearing snaps into position behind the door retainer leaf spring.
10. Adjust the cassette door shaft so screw holes are aligned with screw holes in cradle. Insert the two hex-head screws removed in *Step 3.* Close the door handle. Using a 1/4 inch nutdriver, secure the two hex-head screws.
11. Re-assemble the front and rear covers in the exact reverse order of disassembly.

To verify successful replacement of the door cover, perform the PVT as described in *Section 5.2, (1.5 series)* or *Section 5.3, (1.6 series).*

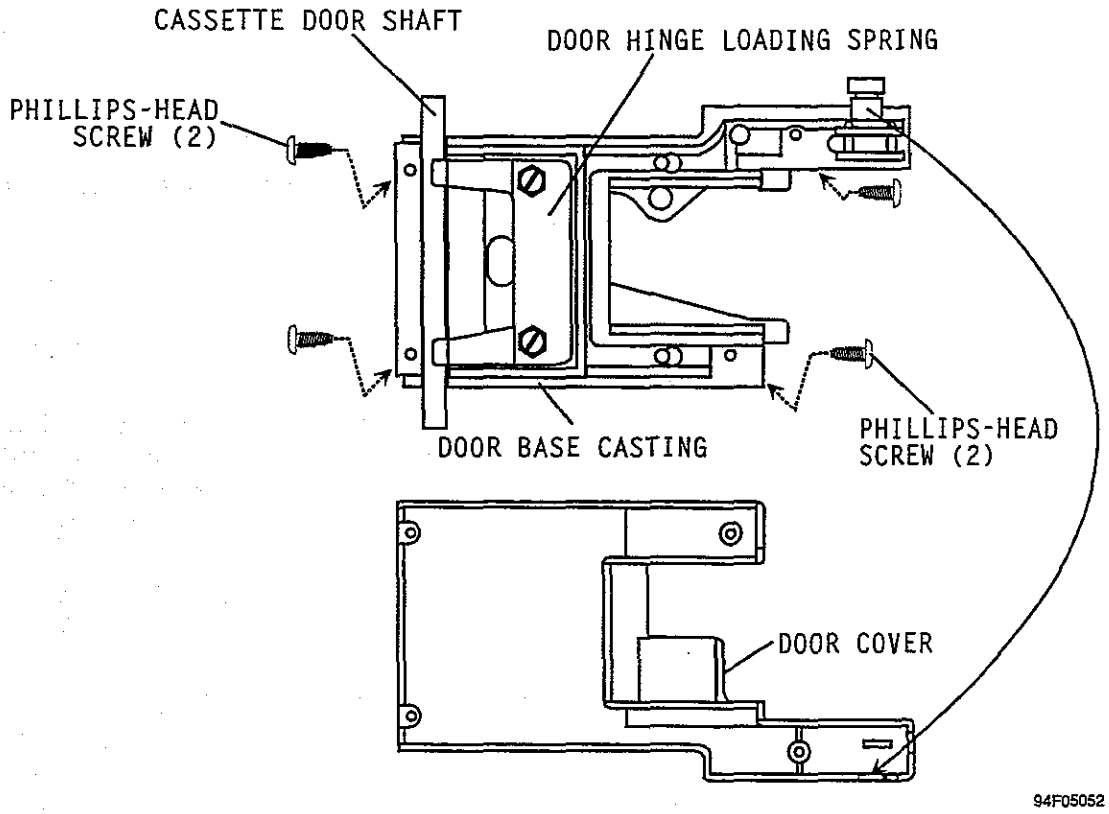


Figure 7-11. Door Assembly Parts Replacement

7.2.23.2

DOOR HINGE LOADING SPRING REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the door hinge loading spring, refer to *Figure 7-11, Door Assembly Parts Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate front and rear covers, as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. Using a 1/4 inch nutdriver, remove the two hex-head screws located on the cassette door shaft.
4. Place the infusion system on its back. Pull up on the cassette door handle and remove the door assembly from the infusion system.
5. Using a No. 1 Phillips screwdriver, remove the four Phillips screws from the door base casting. Separate the door cover from the door base casting.
6. Using a medium flat-blade screwdriver, remove the two hex-head screws securing the door hinge loading spring to the cassette door shaft. Lift the door hinge loading spring free from the door base casting.
7. Apply a small amount of grease to the door hinge loading spring at areas of contact with the cassette door shaft. Replace the door hinge loading spring.

8. Align the door hinge loading spring screw holes with the screw holes in the door base casting. Using a medium flat-blade screwdriver, replace the two hex-head screws securing the door hinge loading spring to the cassette door shaft.
9. Replace the cover by guiding the door base casting into door cover cavity.
10. Using a No. 1 Phillips screwdriver, replace the four Phillips screws in the door base casting.

    CAUTION: Do not overtighten the screws. Overtightening may strip threads.

11. Place the infusion system upside down with the infusion system front facing the technician and the door handle open.
12. Install the door assembly with the door assembly cover facing the technician. Confirm the flat side of the cassette door shaft is facing up and the shaft is centered within the shaft hole. Place the cassette door shaft into the infusion system frame shaft cradle. Confirm the door base casting ball bearing snaps into position behind the door retainer leaf spring.
13. Adjust the cassette door shaft so screw holes are aligned with screw holes in cradle. Insert the two hex-head screws removed in *Step 3.* Close the door handle. Using a 1/4 inch nutdriver, secure the two hex-head screws.
14. Re-assemble the front and rear covers in the exact reverse order of disassembly.

To verify successful replacement of the door hinge loading spring, perform the PVT as described in *Section 5.2, (1.5 series)* or *Section 5.3, (1.6 series).*

7.2.23.3

CASSETTE DOOR SHAFT REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the cassette door shaft, refer to *Figure 7-11, Door Assembly Parts Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate front and rear covers, as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. Using the 1/4 inch nutdriver, remove the two hex-head screws located on the cassette door shaft.
4. Place the infusion system on its back. Pull up on the cassette door handle and remove the door assembly from the infusion system.
5. Using a No. 1 Phillips screwdriver, remove the four Phillips screws from the door base casting. Separate door cover from door base casting.
6. Using a medium flat-blade screwdriver, remove the two hex-head screws securing the door hinge loading spring to the cassette door shaft. Lift the door hinge loading spring free from the door base casting.
7. Using a dry, lint-free cloth, clean the grease from the door hinge loading spring. Set the door hinge loading spring aside for re-assembly.
8. Remove the cassette door shaft by lifting it free of door base casting.

9. Using a dry, lint-free cloth, clean the grease from the cassette door shaft cradle. Apply a small amount of grease 5/8 inch inward from each end of the cassette door shaft cradle.
10. Insert the cassette door shaft and center it in the cradle.
11. Apply a small amount of grease to the door hinge loading spring at areas of contact with the cassette door shaft. Replace the door hinge loading spring.
12. Align the door hinge loading spring screw holes to screw holes in the door base casting. Using a medium flat-blade screwdriver, replace the two hex-head screws securing the door hinge loading spring to the cassette door shaft.
13. Assemble the door cover to the door base casting by guiding the door base casting into the door cover cavity. Using a No. 1 Phillips screwdriver, replace the four Phillips screws in the door base casting.

    CAUTION: Do not overtighten the screws. Overtightening may strip screw threads.

14. Place the infusion system upside down with the infusion system front facing the technician and the door handle open.
15. Install the door assembly with the door assembly cover facing the technician. Confirm the flat side of the cassette door shaft is facing up and the shaft is centered within the shaft hole. Place the cassette door shaft into the infusion system frame shaft cradle. Verify the door base casting ball bearing snaps into position behind the door retainer leaf spring.
16. Adjust the cassette door shaft so screw holes are aligned with screw holes in cradle. Insert the two hex-head screws removed in *Step 3*. Close the door handle. Using a 1/4 inch nutdriver, secure the two hex-head screws.
17. Re-assemble the front and rear covers in the exact reverse order of disassembly.

To verify successful replacement of the cassette door shaft, perform the PVT as described in *Section 5.2, (1.5 series)* or *Section 5.3, (1.6 series)*.

7.2.23.4

DOOR BASE CASTING REPLACEMENT

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the door base casting, refer to *Figure 7-9, Cassette Loading Leaf Spring Replacement*, and *Figure 7-11, Door Assembly Parts Replacement*, then proceed as follows:

Note: The door base casting has two roll pins, ball bearing, and a setscrew that are factory installed.

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers, as described in *Section 7.2.13, Separating the Front and Rear Covers.*
3. Using a 1/4 inch nutdriver, remove the two hex-head screws located on the cassette door shaft.
4. Place the infusion system on its back. Pull up on the cassette door handle and remove the door assembly from the infusion system.

5. Using a No. 1 Phillips screwdriver, remove the four Phillips screws from the door base casting. Separate the door cover from the door base casting.
6. Using a medium flat-blade screwdriver, remove the two hex-head screws securing the door hinge loading spring to the cassette door shaft. Lift the door hinge loading spring free from the door base casting. Using a dry, lint-free cloth, clean the grease from the door hinge loading spring and set it aside for re-assembly.
7. Remove the cassette door shaft by lifting it free of the door base casting. Clean the existing grease from the cassette door shaft and the door base casting. Set the cassette door shaft and the door base casting aside for re-assembly.
8. Remove the cassette loading leaf spring. Using a small flat-blade screwdriver, remove the two screws securing the cassette loading leaf spring to the door base casting. Slide the cassette loading leaf spring from the door base casting.
9. Replace the cassette loading leaf spring on the new door base casting. Guide the two locator pins in slotted holes on the door assembly. Slide the leaf spring back until the screw holes are aligned.
10. Using a small flat-blade screwdriver, replace the two screws securing the cassette loading leaf spring to the door base casting.
11. Apply a small amount of grease 5/8 inch inward from each end of the cassette door shaft cradle.
12. Insert the cassette door shaft and center it in the cradle.
13. Apply a small amount of grease to the door hinge loading spring at areas of contact with the cassette door shaft. Replace the door hinge loading spring.
14. Align the door hinge loading spring screw holes with the screw holes in the door base casting. Using a medium flat-blade screwdriver, replace the two hex-head screws securing the door hinge loading spring to the cassette door shaft.
15. Replace the door cover by guiding the door base casting into the door cover cavity.
16. Using a No. 1 Phillips screwdriver, replace the four Phillips screws in the door base casting.

    CAUTION: Do not overtighten the screws. Overtightening may strip screw threads.

17. Place the infusion system upside down with the infusion system front facing the technician and the door handle in the open position.
18. Install the door assembly with the door assembly cover facing the technician. Confirm the flat side of the cassette door shaft is facing up and the shaft is centered within the shaft hole. Place the cassette door shaft into the infusion system frame shaft cradle. Verify the door base casting ball bearing snaps into position behind the door retainer leaf spring.
19. Adjust the cassette door shaft so screw holes are aligned with screw holes in cradle. Insert the two hex-head screws removed in *Step 3.* Close the door handle. Using a 1/4 inch nutdriver, secure the two hex-head screws.
20. Re-assemble the front and rear covers in the exact reverse order of disassembly.

To verify successful replacement of the door base casting, perform the PVT as described in *Section 5.2, (1.5 series)* or *Section 5.3, (1.6 series).*

7.2.24

I/O PORT PANEL REPLACEMENT

The recommended tools for this procedure are as follows: medium flat-blade screwdriver, No. 2 Phillips screwdriver, 1/4 inch nutdriver, 5/32 inch nutdriver, X-acto knife, and needle-nose pliers.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

Note: Although the I/O port panel does not wear out, the foam gasket attached to the panel may need to be replaced. If the gasket is defective, the I/O port panel must also be replaced.

To replace the I/O port panel, refer to *Figure 7-12, I/O Port Panel and Piezoelectric Alarm Replacement*, then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers*. Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement*, the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement*, the main PWA and I/O PWA as described in *Section 7.2.17, Main PWA and I/O PWA Replacement*, and the power supply PWA as described in *Sections 7.2.18, Power Supply PWA and Mechanism Assembly Replacement (1.5 series)*, or *Section 7.2.19, Power Supply PWA, Mechanism Assembly, and Battery Charger PWA Replacement (1.6 series)*.
3. Place infusion system on its base. Using a 1/4 inch nutdriver, remove the three hex-head screws attaching the I/O port panel to the rear casting. Set the screws aside for re-assembly.
4. Remove and replace I/O port panel.
5. Replace the power supply PWA, and the Main and I/O PWAs in exact reverse order of removal.
6. Reconnect all cables, headers, and wire harnesses in the exact reverse order of removal.
7. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
8. Disconnect AC (mains) power. Replace the front panel assembly and EMI shield in exact reverse order of removal.
9. Re-assemble the front and rear covers in the exact reverse order of disassembly.

To verify successful replacement of the I/O port panel, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series)*.

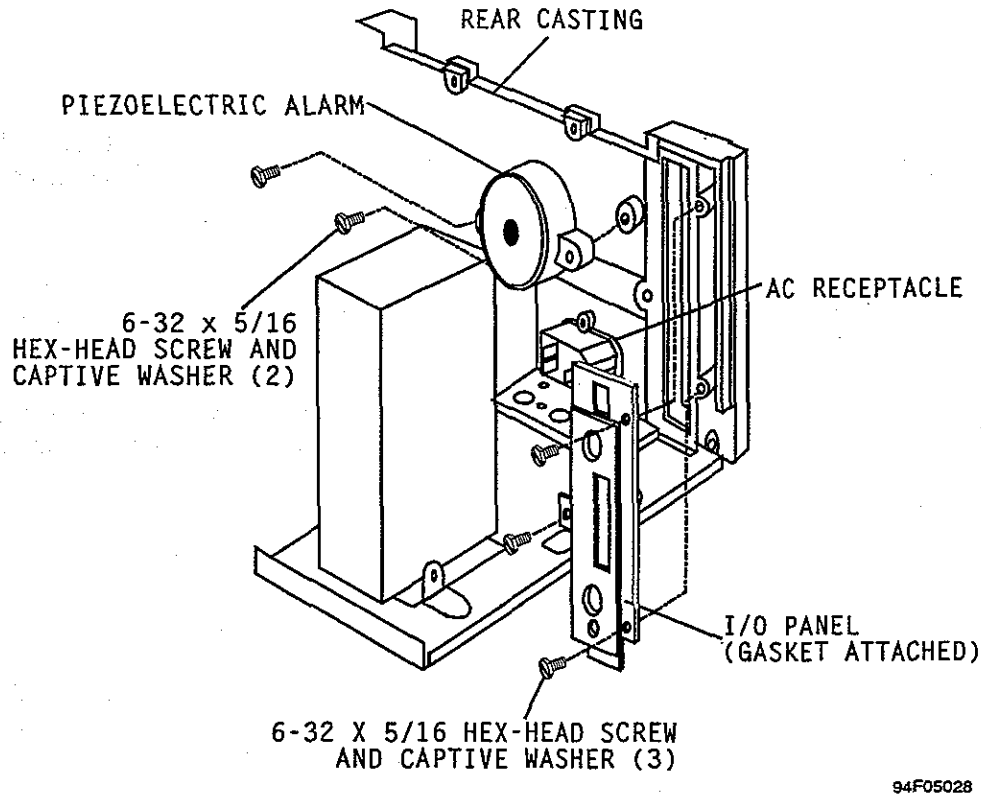


Figure 7-12. I/O Port Panel and Piezoelectric Alarm Replacement

7.2.25

PIEZOELECTRIC ALARM ASSEMBLY REPLACEMENT

The recommended tools for this procedure are as follows: medium flat-blade screwdriver, No. 2 Phillips screwdriver, 1/4 inch nutdriver, 5/32 inch nutdriver, X-acto knife, needle-nose pliers, and 1/4 inch right-angle socket wrench.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To replace the piezoelectric alarm assembly, refer to *Figure 7-12, I/O Port Panel and Piezoelectric Alarm Replacement,* then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers.* Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement,* the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement,* the main PWA and I/O PWA as described in *Section 7.2.17, Main PWA and I/O PWA Replacement,* and the power supply PWA as described in *Sections 7.2.18 Power Supply PWA and Mechanism Assembly Replacement (1.5 series),* or *Section 7.2.19, Power Supply PWA, Mechanism Assembly, and Battery Charger PWA Replacement (1.6 series).*
3. Place infusion system upright. Using a 1/4 inch right-angle socket wrench, remove the two hex-head screws securing the piezoelectric alarm assembly to the rear casting. Set the two screws aside for re-assembly.
4. Remove and replace the piezoelectric alarm assembly.

5. Replace the power supply PWA, and the Main and I/O PWAs in the exact reverse order of removal.
6. Reconnect all cables, headers, and wire harnesses in the exact reverse order of removal.
7. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
8. Disconnect AC (mains) power. Replace the front panel assembly and EMI shield in the exact reverse order of removal. Re-assemble the front and rear covers in the exact reverse order of disassembly.

To verify successful replacement of the piezoelectric alarm assembly, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series)*.

7.2.26
AC RECEPTACLE ASSEMBLY REPLACEMENT

The recommended tools for this procedure are as follows: medium flat-blade screwdriver, No. 2 Phillips screwdriver, 1/4 inch nutdriver, 5/32 inch nutdriver, X-acto knife, needle-nose pliers, and 1/4 inch right-angle socket wrench.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To remove the AC (mains) receptacle assembly, refer to *Figure 7-12, I/O Port Panel and Piezoelectric Alarm Replacement*, then proceed as follows:

1. Disconnect the infusion system from AC (mains) power.
2. Separate the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers*. Remove the EMI shield, as described in *Section 7.2.14, EMI Shield Replacement*, the front panel assembly, as described in *Section 7.2.16, Front Panel Assembly Replacement*, the main PWA and I/O PWA as described in *Section 7.2.17, Main PWA and I/O PWA Replacement*, and the power supply PWA as described in *Sections 7.2.18 Power Supply PWA and Mechanism Assembly Replacement (1.5 series)*, or *Section 7.2.19, Power Supply PWA, Mechanism Assembly, and Battery Charger PWA Replacement (1.6 series)*.
3. Using a 1/4 inch right-angle socket wrench, remove the hex-head screw and lockwasher securing the ground (earth) wire to the rear casting. Set the screw and lockwasher aside for re-assembly.
4. Using a No. 2 Phillips screwdriver, remove the two screws securing the AC (mains) receptacle assembly and wire harness to the rear casting. Pull the receptacle assembly and wire harness through the rear casting opening until the T1 power transformer connector is visible.
5. Disconnect the power transformer connector from the power transformer leads.
6. Remove and replace AC (mains) receptacle assembly.
7. Install the power transformer connector through the receptacle opening.

   Note: If the power transformer connector has moved inside the rear casting opening, retrieve it with needle-nose pliers.

8. Connect the plug end of the AC (mains) receptacle assembly to the power transformer connector. Push the AC (mains) receptacle assembly and wire harness through the rear casting opening.
9. Using a 1/4 inch right-angle socket wrench, replace the hex-head screw and lockwasher securing the ground (earth) wire to the rear casting.

   Note: For proper grounding, the star lockwasher must be positioned between the ground lug and the rear casting housing.

10. Replace the power supply PWA, and the Main and I/O PWAs in the exact reverse order of removal.
11. Reconnect all cables, headers, and wire harnesses in the exact reverse order of removal.
12. Connect the infusion system to AC (mains) power and verify successful completion of the self test.
13. Disconnect AC (mains) power. Replace the front panel assembly and EMI shield in the exact reverse order of removal.
14. Re-assemble the front and rear covers in the exact reverse order of disassembly.

To verify successful replacement of the AC (mains) receptacle assembly, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series).*

7.2.27

JUNCTION BOX REPLACEMENT (1.6 SERIES WITH DATAPORT)

No tools are recommended for this procedure.

To replace the junction box, proceed as follows:

1. Place the infusion system with the rear facing the technician.
2. Loosen the jackscrews securing the junction box to the infusion system connector. Remove and replace the junction box.
3. Tighten the jackscrews securing the junction box to the infusion system connector.

Replacement of the junction box is a routine maintenance procedure and no verification procedure is normally required. However, if the infusion system may have been damaged during this procedure, perform the PVT as described in *Section 5.3.*

7.2.28

DATAPORT ACCESSORY CABLE REPLACEMENT (1.6 SERIES WITH DATAPORT)

The recommended tool for this procedure is a small flat-blade screwdriver.

Table 7-1, Accessories for 1.6 Series Infusion Systems, lists DataPort accessory cable part descriptions and associated list numbers. Refer to *Figure 7-13, DataPort Accessory Cable Schematics,* for connector information.

To replace a DataPort accessory cable that contains a six-pin modular connector at the junction box, compress the tab on the connector and disconnect the cable. To replace a DataPort accessory cable that contains a connector type other than six-pin modular at the junction box, use a small flat-blade screwdriver or compress the tabs as appropriate.

Replacement of the DataPort accessory cable is a routine maintenance procedure and no verification procedure is normally required. However, if the infusion system may have been damaged during this procedure, perform the PVT as described in *Section 5.3*.

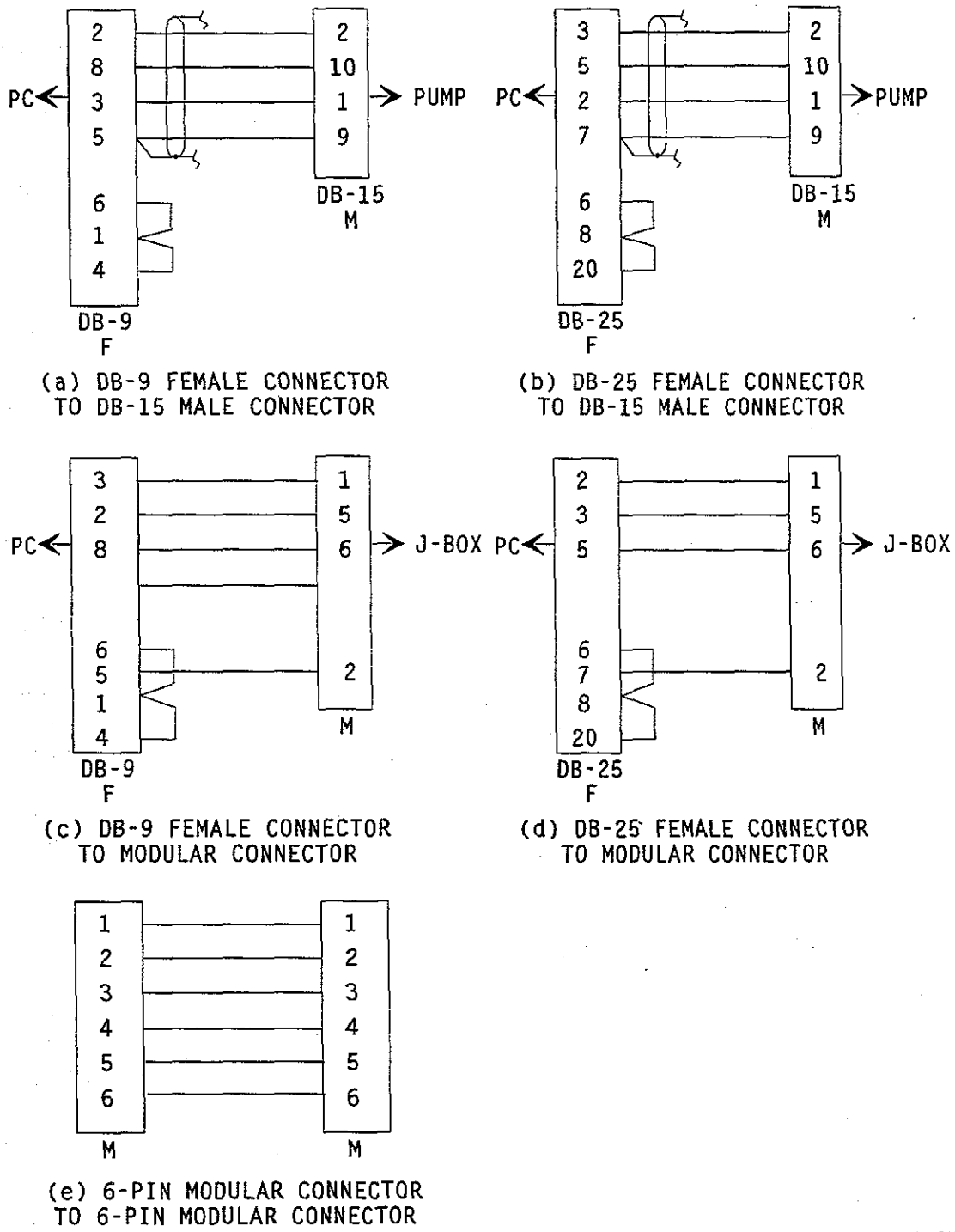


Figure 7-13. DataPort Accessory Cable Schematics

7.2.29

MECHANISM ASSEMBLY CLEANING AND LUBRICATION

The recommended tools for this procedure are as follows: small size flat-blade screwdriver, medium size flat-blade screwdriver, 1/4-inch nutdriver, small six-inch brush, PlumSet, Electro-Wash 2000 or isopropyl alcohol, cotton swabs, and Braycote 804 grease.

Note: Electro-Wash 2000 can be obtained locally. Isopropyl alcohol may be substituted for Electro-Wash 2000; however, if using isopropyl alcohol, assure that all residual lubricant is removed. Braycote 804 grease can be obtained from Abbott Laboratories, or may be obtained locally.

CAUTION: Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected workstation. Store PWA in an antistatic bag before placing it on any surface.

To clean and lubricate the mechanism assembly, refer to *Figure 7-14, Plunger Shaft Threads and Plunger Nut Lubrication*, and *Figure 7-15, Mechanism Assembly Lubrication Points*, then proceed as follows:

1. Remove the mechanism assembly as described in *Section 7.2.18.1, Mechanism Assembly Replacement (1.5 series)*, or *Section 7.2.19.2, Mechanism Assembly Replacement (1.6 series)*.

   Note: Do not remove the power supply PWA.

2. Load a cassette into the cassette door. Close the cassette door.
3. Remove the remaining three infusion system cables connecting the sensor PWA to the I/O PWA, bubble sensor PWA, and pressure sensor.
4. Using a 1/4-inch nutdriver, remove the two hex-head screws securing the sensor PWA to the mechanism assembly. Remove the sensor PWA.
5. Using a 1/4-inch nutdriver, remove the two hex-head screws securing the plunger motor to the mechanism assembly.
6. Grasp the plunger motor and rotate the plunger motor coupling counterclockwise until the plunger motor and plunger motor coupling disengage from the plunger shaft.

   CAUTION: Do not remove the plunger motor coupling from the plunger motor. Do not remove the brass nut.

7. Inspect the door shield for foreign matter. If necessary, remove the door shield from the mechanism assembly as described in *Section 7.2.31, Door Shield Replacement*.
8. Using Electro-Wash 2000 or isopropyl alcohol, clean the mechanism assembly as follows:
   - Clean the plunger shaft. Use a small six-inch brush to remove the existing grease.
   - Clean the inside of the plunger nut. Use a cotton swab to remove the existing grease.

- Clean any foreign matter from the component side of the bubble sensor PWA, the component side of the sensor PWA, each mechanism assembly lubrication point (*refer to Figure 7-14, Plunger Shaft Threads and Plunger Nut Lubrication*), and behind the door shield (if removed).

Note: If isopropyl alcohol is used, verify the alcohol evaporates prior to application of Braycote 804 grease.

9. Apply grease to the first 1/2 inch of the plunger shaft threads, using enough grease to fill the threads, as well as the threads inside the plunger nut (*refer to Figure 7-15, Mechanism Assembly Lubrication Points*).
10. Apply an adequate amount of grease (approximately 0.1 cc) to each of the mechanism assembly lubrication points.
11. If the door shield was removed, replace it in the exact reverse order of removal.
12. Grasp the plunger motor, motor wires up, and insert the plunger motor coupling on the plunger shaft. Rotate the plunger motor coupling clockwise until the plunger motor is flush against the mechanism assembly.
13. Using a 1/4-inch nutdriver, replace the two hex-head screws securing the plunger motor to the mechanism assembly.

    Note: Confirm that the hex-head screws securing the plunger motor to the mechanism assembly are fully tightened.
14. Using a small size flat-blade screwdriver, rotate the I/O flags to the full up position.
15. Install the sensor PWA; do not force it into position. Use a small size flat-blade screwdriver to compress the microswitch lever located on the sensor PWA.

    Note: Pressing the primary valve pin while seating the sensor PWA will reposition the I/O flags and allow the sensor PWA to be seated more easily.
16. Verify that the sensor PWA is fully seated in the motor base notches. Using a 1/4-inch nutdriver, replace the two hex-head screws securing the sensor PWA to the mechanism assembly.
17. Inspect the four optical interrupters. Verify that the four optical interrupter motor flags rotate freely and have adequate sensor clearance.
18. Replace the three infusion system cables connecting the sensor PWA to the I/O PWA, bubble sensor PWA, and pressure sensor.
19. Open the cassette door and remove the cassette. Close the cassette door.
20. Replace the mechanism assembly in exact reverse order of removal.

To verify successful cleaning and lubrication of the mechanism assembly, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series)*.

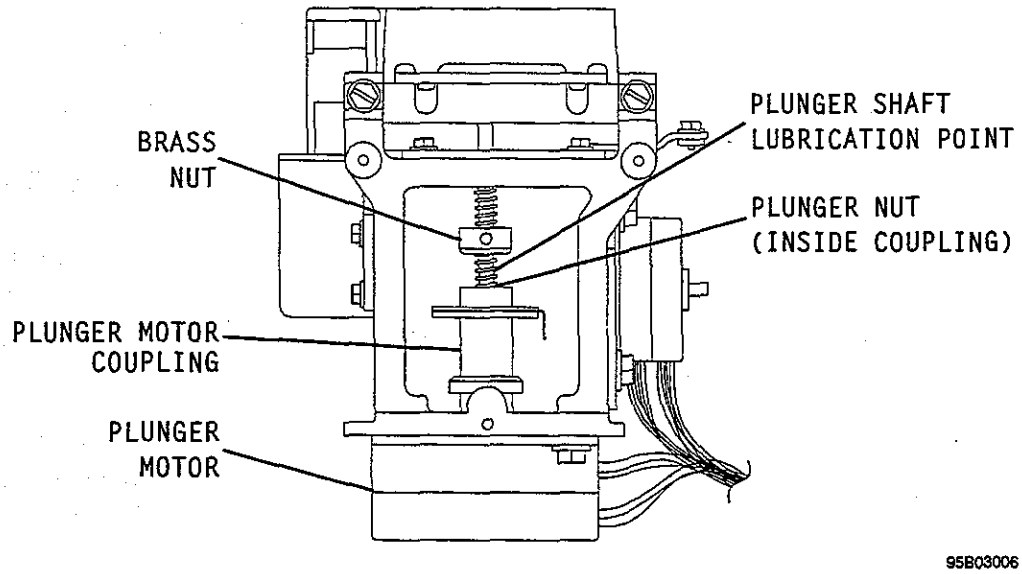


Figure 7-14. Plunger Shaft Threads and Plunger Nut Lubrication

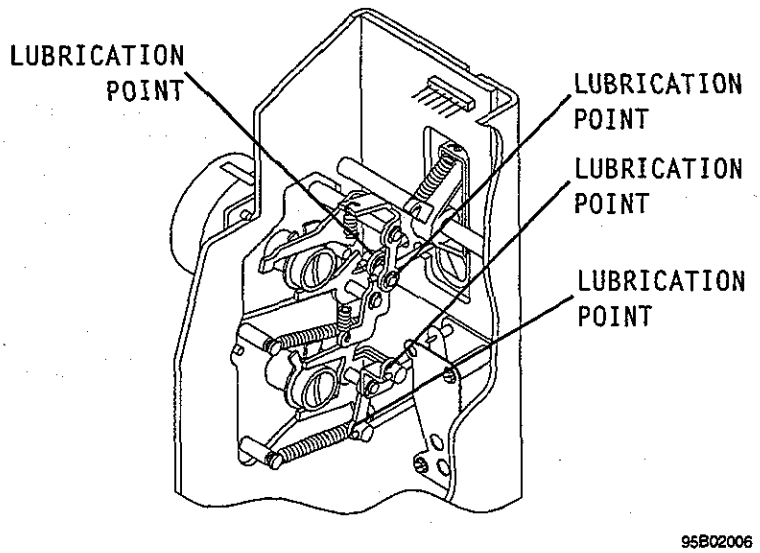


Figure 7-15. Mechanism Assembly Lubrication Points

7.2.30

DISTAL PRESSURE SENSOR ELECTRICAL ADJUSTMENT

Recommended tools for this procedure are as follows: small flat-blade screwdriver; DMM; red GLPT insulating varnish; PlumSet, List No. 6426, or equivalent; large bore needle (18-gauge); 20 cc syringe with the volume limited at 20 cc; DPM; and a three-way stopcock.

Note: For all testing, the vertical height distance from the top of the fluid in the flexible container to midline of the cassette must be 18 ± 6 inches (46 ± 15 cm).

Note: Cassettes used in this procedure should be replaced daily.

To perform the distal pressure sensor electrical adjustment, proceed as follows:

1. Remove the front and rear covers as described in *Section 7.2.13, Separating the Front and Rear Covers*. Remove the EMI shield as described in *Section 7.2.14, EMI Shield Replacement*.
2. Insert a primed cassette and close the door. Attach the negative lead of the DMM to TP0 and the positive lead to TP1 on the sensor PWA.
3. Connect the distal tubing to the three-way stopcock and attach to the DPM.
4. Attach the 18-gauge needle into the lower Y site of the distal tubing, as shown in *Figure 5-5, Pressure Sensor Test Setup*.
5. Open the stopcock to air.
6. Verify that the DPM reads 0 psi. Adjust R15 to obtain 1.37 ± 0.015 V on the DMM.
7. Move the stopcock to read the pressure. Using the 20 cc syringe, create a back pressure of 8 psi.
8. While holding 8 psi of pressure, adjust R14 to obtain 2.97 ± 0.015 V.
9. Repeat Steps 5 through 7 until the specified voltages are within limits.

   Note: If the voltage cannot be adjusted within specifications, the infusion system must be returned for mechanical adjustment of the sensors. See *Section 6.1, Technical Assistance*.

10. Add one drop of red GLPT insulating varnish to R14 and R15.
11. Re-assemble the infusion system in the exact reverse order of disassembly.

To verify successful digital pressure sensor electrical adjustment, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series)*.

7.2.31

DOOR SHIELD REPLACEMENT

The recommended tool for this procedure is a medium size flat-blade screwdriver.

To replace the door shield, proceed as follows:

1. Remove the door assembly as described in *Section 7.2.23, Door Assembly Replacement*.
2. Using a medium size flat-blade screwdriver, remove the four screws securing the door shield to the mechanism assembly.
3. Remove the door shield by pulling it straight out.
4. Replace the door shield in the exact reverse order of removal.
5. Replace the door assembly in the exact reverse order of removal.

To verify successful door shield replacement, perform the PVT as described in *Section 5.2 (1.5 series)* or *Section 5.3 (1.6 series)*.

Section 8

SPECIFICATIONS

This section contains specifications for the 1.5 series and 1.6 series domestic and international infusion systems.

8.1
DOMESTIC INFUSION SYSTEM (1.5 SERIES)

The following specifications apply to the domestic infusion system (1.5 series) only.

PHYSICAL	
Dimensions:	Approximately 18 x 23 x 23 cm (7 x 9 x 9 inches), excluding pole clamp protrusion and power cord storage
Weight:	Approximately 6.0 kg (13 lbs), with battery
Casing:	High-impact plastic
ELECTRICAL	
Power Requirements:	110 to 120 AC, 50/60 Hz, 30 W
Power Cord:	Hospital-grade AC (mains) power cord. 8 feet long, with transparent plug and retainer plate (on infusion system)
Fuses:	0.4 A or 0.5 A (depending on label), 250 V, slo-blo
Battery:	One sealed, rechargeable 8 volt battery, internal to system. Accessible for ease of field replacement, with color-coded leads and polarized connector
	Battery life (new batteries, full charge at 20° C): Approximately 500 mL total volume delivered, or six hours of operation, whichever occurs first
Battery Recharge:	Battery is on recharge any time infusion system is connected to AC (mains) power. Recharge rate: to 80% of prior charge in 16 hours while operating at a delivery rate of 125 mL/hr or less (*see Section 4.3, Battery Overview*)
Battery Self-Discharge:	50% of charge retained for at least one month when infusion system is neither connected to AC (mains) power nor operating
Electrical Leakage:	Risk current limits meet ANSI/AAMI ES1-1985 (ungrounded) standard
ENVIRONMENT	
Temperature:	10° to 40° C (50° to 104° F)

Relative Humidity:	10% to 90%, noncondensing
Pressure:	Equivalent altitudes from 0 to 10,000 feet

SHIPPING AND STORAGE

Temperature (infusion system only):	-34° to 60° C (-29.2° to 140° F)
Temperature (set only):	-34° to 55° C (-29.2° to 131° F)
Relative Humidity:	10% to 90% noncondensing at temperatures up to 40° C (104° F). A maximum of 15% noncondensing at temperatures from 41° to 60° C (105.8° to 140° F)

DELIVERY RATE RANGE

Micro Mode:	0.1 to 99.9 mL/hr (in 0.1 mL increments; total primary rate plus secondary rate cannot exceed 99.9 mL/hr). In the concurrent mode, the rates for either primary or secondary cannot be less than 0.5 mL/hr
Macro Mode:	1 to 999 mL/hr (in 1 mL increments). In the concurrent mode, total primary rate plus secondary rate cannot exceed 800 mL/hr

DOSE LIMIT RANGE

Micro Mode:	0.1 to 999 mL (in 0.1 mL increments)
Macro Mode:	1 to 9999 mL (in 1 mL increments)

SECONDARY DOSES:

Dual Channel Delivery:	A single dose of a secondary fluid may be administered
Multidose Delivery:	1 to 24 doses of a secondary fluid may be administered at intervals from 15 minutes to 24 hours

OPERATING BACKPRESSURE:	-2 to 8 psig (-14 to 55 kPa)
OCCLUSION ALARM:	Maximum pressure is user selectable from 1 to 8 psig (7 to 55 kPa), through the front panel touchswitches
Distal:	DISTAL OCCLUSION alarm sounds within two pumping cycles after the distal set tubing or set outlet fitting becomes occluded
Proximal:	PROXIMAL OCCLUSION alarm sounds if the tubing proximal to the cassette becomes occluded

AIR-IN-LINE ALARM:

Distal:	STOPPED AIR IN DISTAL LINE alarm sounds if a bubble 100 microliters or larger passes the distal air-in-line

sensors. (Alarm may sound at detection of a bubble as small as 50 microliters)

Proximal: STOPPED AIR IN PROXIMAL LINE alarm sounds if a bubble approximately 1200 microliters or larger passes through the proximal air-in-line sensors

NURSE-CALL SYSTEM: NURSE-CALL alarm is factory set for normally open (NO)

Note: Contact Abbott Laboratories to make an internal adjustment to change the infusion system from a normally open (NO) to normally closed (NC) system

8.2
DOMESTIC INFUSION SYSTEM (1.6 SERIES)

The following specifications apply to the domestic infusion system (1.6 series) only.

PHYSICAL	
Dimensions:	Approximately 18 x 23 x 23 cm (7 x 9 x 9 inches), excluding pole clamp protrusion and power cord storage
Weight:	Approximately 6.0 kg (13 lbs), with battery
Casing:	High-impact plastic
ELECTRICAL	
Power Requirements:	110 to 120 AC, 50/60 Hz, 30 W
Power Cord:	Hospital-grade AC (mains) power cord. 8 feet long, with transparent plug and retainer plate (on infusion system)
Fuses:	0.5 A, 250 V, slo-blo
Battery:	One sealed, rechargeable 8 volt battery, internal to system. Accessible for ease of field replacement, with color-coded leads and polarized connector
	Battery life (new batteries, full charge at 20° C): Approximately 500 mL total volume delivered, or six hours of operation, whichever occurs first
Battery Recharge:	Battery is on recharge any time infusion system is connected to AC (mains) power. Recharge rate: to 80% of prior charge in 16 hours while operating at a delivery rate of 125 mL/hr or less
Battery Self-Discharge:	50% of charge retained for at least one month when infusion system is neither connected to AC (mains) power nor operating
Electrical Leakage:	Risk current limits meet ANSI/AAMI ES1-1985 (ungrounded) standard
ENVIRONMENT	
Temperature:	10° to 40° C (50° to 104° F)
Relative Humidity:	10% to 90%, noncondensing
Pressure:	Equivalent altitudes from 0 to 10,000 feet
SHIPPING AND STORAGE:	
Temperature (infusion system only):	-34° to 60° C (-29.2° to 140° F)
Temperature (set only):	-34° to 55° C (-29.2° to 131° F)

Relative Humidity:	10% to 90% noncondensing at temperatures up to 40° C (104° F). A maximum of 15% noncondensing at temperatures from 41° to 60° C (105.8° to 140° F)
DELIVERY RATE RANGE	
Micro Mode:	0.1 to 99.9 mL/hr (in 0.1 mL increments; total primary rate plus secondary rate cannot exceed 99.9 mL/hr). In the concurrent mode, the rates for either primary or secondary cannot be less than 0.5 mL/hr
Macro Mode:	1 to 999 mL/hr (in 1 mL increments). In the concurrent mode, total primary rate plus secondary rate cannot exceed 700 mL/hr
DOSE LIMIT RANGE	
Micro Mode:	0.1 to 999 mL (in 0.1 mL increments)
Macro Mode:	1 to 9999 mL (in 1 mL increments)
SECONDARY DOSES	
Dual Channel Delivery:	A single dose of a secondary fluid may be administered
Multidose Delivery:	1 to 24 doses of a secondary fluid may be administered at intervals from 15 minutes to 24 hours
OPERATING BACKPRESSURE	-2 to 10 psig (-14 to 69 kPa)
OCCLUSION ALARM:	Maximum pressure is user selectable from 0.1 to 10 psig (0.7 to 69 kPa), through the front panel touchswitches
Distal:	DISTAL OCCLUSION alarm sounds within two pumping cycles after the distal set tubing or set outlet fitting becomes occluded
Proximal:	PROXIMAL OCCLUSION alarm sounds if the tubing proximal to the cassette becomes occluded
AIR-IN-LINE ALARM	
Distal:	STOPPED AIR IN DISTAL LINE alarm sounds if a bubble 100 microliters or larger passes the distal air-in-line sensors. (Alarm may sound at detection of a bubble as small as 50 microliters)
Proximal:	STOPPED AIR IN PROXIMAL LINE alarm sounds if a bubble approximately 1200 microliters or larger passes through the proximal air-in-line sensors
NURSE-CALL SYSTEM	NURSE-CALL alarm is factory set for normally open (NO)

Note: Contact Abbott Laboratories to make an internal adjustment to change the infusion system from a normally open (NO) to normally closed (NC) system

FLOW DETECTOR: Optional. Detects drops when attached to the primary site. Used to identify empty container conditions

DataPort: Optional. The DataPort communication system provides monitoring of up to 15 infusion systems connected to the same communication signal lines. The hardware configuration is a modified version of the EIA-232-D configuration

8.3
INTERNATIONAL INFUSION SYSTEM (1.5 SERIES)

The following specifications apply to the international infusion system (1.5 series) only.

PHYSICAL	
Size:	18 x 23 x 23 cm (7 x 9 x 9 inches) excluding pole clamp
Weight:	Approximately 6.0 kg (13 lbs), with battery
Mains Voltage:	110 to 120 V~, 50/60 Hz, 30 VA 220 to 240 V, 50/60 Hz, 35 VA 100 V, 50/60 Hz, 35 VA
Mains Fusing:	(110 to 120 V~) Two each: (depending on label code), 250 V, 5 x 20 mm, T400 mA or T500 mA (100 V~) Two each: T500 mA, 250 V, 5 x 20 mm (220 to 240 V~) Two each: T160 mA, 250 V, 5 x 20 mm
Mains Cord	(110 to 120 V~) UL hospital-grade AC (mains) power cord, 2.5 ± 0.5 m (8 feet) in length (220 to 240 V~) IEC 601-1 approved detachable cord, 2.5 ± 0.5 m (8 feet) in length
Battery	One sealed, rechargeable 8 volt battery, internal to infusion system. Accessible for ease of field replacement, with color-coded leads and polarized connector
Battery Operating Time:	Battery life (new batteries, full charge at 20° C): Approximately 500 mL total volume delivered, or six hours of operation, whichever occurs first With a new, fully charged battery, at a delivery rate of 125 mL/hr, the infusion system displays a LOW BATTERY alarm at least 15 minutes prior to shutdown **Note:** If a LOW BATTERY alarm occurs, immediately connect the infusion system to mains power **Note:** Gradual degradation over extended periods of use decreases the operational capacity of the battery. Typical battery life is three years. A yearly check is recommended to verify performance. When capacity drops to an unacceptable level, replace the battery. Battery replacement must be performed by qualified technical personal.
Battery Recharge:	Battery recharges when infusion system is connected to mains power. Battery recharges to 80% of prior charge in 24 hours
Battery Charge Retention:	A fully charged battery will retain at least 50% of its capacity after one month when infusion system is neither connected to mains power nor operating

Nurse-Call System: NURSE-CALL alarm is factory set for normally open (NO) systems. An internal adjustment may be made by qualified technical personnel

Electronic Memory: Settings are retained for four hours after power is turned off

Electrical Safety: (110 to 120 V) meets UL 544 standards
(100 and 220 to 240 V) meets IEC 601-1 standards

Class 1: Mains supply equipment using protective earth

Type B:  Equipment providing adequate degree of protection against electrical shock (see pump labeling to determine class of protection)

Type BF:  Equipment providing adequate degree of protection against electrical shock (see pump labeling to determine class of protection)

Type CF:  Equipment providing adequate degree of protection against electrical shock (see pump labeling to determine class of protection)

 Terminal for connection of an equipotential conductor

Drip Proof IPX1: Equipment protected against dripping water

 Attention! Consult accompanying documents

Fluids and Cleaning: Infusion system is not affected by fluid spills or common cleaning solutions

Operating Environment: 10° to 40° C (50° to 104° F), 10% to 90% relative humidity

Shipping/Storage Environment: -20° to 60° C (-4° to 140° F), 10% to 90% relative humidity

Occlusion Alarm Pressure Limit: Selectable from 7 to 55 kPa (1 to 8 psig)

Maximum Occlusion Pressure 128 kPa (18 psig, approximate)

Delivery Rate Accuracy: ± 5% in typical clinical use

DELIVERY RATE RANGE

Micro Mode: 0.1 to 99.9 mL/hr (in 0.1 mL increments; total primary rate plus secondary rate cannot exceed 99.9 mL/hr). In the concurrent mode, the rates for either primary or secondary cannot be less than 0.5 mL/hr

Macro Mode: 1 to 999 mL/hr (in 1 mL increments). In the concurrent mode, total primary rate plus secondary rate cannot exceed 800 mL/hr

DOSE LIMIT RANGE

Micro Mode: 0.1 to 999 mL (in 0.1 mL increments)

Macro Mode: 1 to 9999 mL (in 1 mL increments)

AIR-IN-LINE ALARM

Distal: STOPPED AIR IN DISTAL LINE alarm sounds if a bubble 100 microliters or larger passes the distal air-in-line sensors. (Alarm may sound at detection of a bubble as small as 50 microliters)

Proximal: STOPPED AIR IN PROXIMAL LINE alarm sounds if a bubble approximately 1200 microliters or larger passes through the proximal air-in-line sensors

8.4
INTERNATIONAL INFUSION SYSTEM (1.6 SERIES)

The following specifications apply to the international infusion system (1.6 series) only.

PHYSICAL

Size:	18 x 23 x 23 cm (7 x 9 x 9 inches) excluding pole clamp
Weight:	Approximately 6.0 kg (13 lbs), with battery
Mains Voltage:	110 to 120 V~, 50/60 Hz, 30 VA 220 to 240 V, 50/60 Hz, 35 VA 100 V, 50/60 Hz, 35 VA
Mains Fusing:	(110 to 120 V~) Two each: T500 mA, 250 V, 5 x 20 mm (100 V~) Two each: T630 mA, 250 V, 5 x 20 mm (220 to 240 V~) Two each: T200 mA, 250 V, 5 x 20 mm
Mains Cord	(110 to 120 V~) UL hospital-grade AC (mains) power cord, 2.5 ± 0.5 m (8 feet) in length (220 to 240 V~) IEC 601-1 approved detachable cord, 2.5 ± 0.5 m (8 feet) in length
Battery	One sealed, rechargeable 8 volt battery, internal to infusion system. Accessible for ease of field replacement, with color-coded leads and polarized connector
Battery Operating Time:	Battery life (new batteries, full charge at 20° C): Approximately 500 mL total volume delivered, or six hours of operation, whichever occurs first With a new, fully charged battery, at a delivery rate of 125 mL/hr, the infusion system displays a LOW BATTERY alarm at least 15 minutes prior to shutdown **Note:** If a LOW BATTERY alarm occurs, immediately connect the infusion system to mains power **Note:** Gradual degradation over extended periods of use decreases the operational capacity of the battery. Typical battery life is three years. A yearly check is recommended to verify performance. When capacity drops to an unacceptable level, replace the battery. Battery replacement must be performed by qualified technical personal.
Battery Recharge:	Battery recharges when infusion system is connected to mains power. Battery recharges to 80% of prior charge in 24 hours
Battery Charge Retention:	A fully charged battery will retain at least 50% of its capacity after one month when infusion system is neither connected to mains power nor operating

Nurse-Call System:	NURSE-CALL alarm is factory set for normally open (NO) systems. An internal adjustment may be made by qualified technical personnel
Electronic Memory:	Settings are retained for four hours after power is turned off
Electrical Safety:	(110 to 120 V) meets UL 544 standards (100 and 220 to 240 V) meets IEC 601-1 standards
Class 1:	Mains supply equipment using protective earth
Type CF: 	Equipment providing adequate degree of protection against electrical shock (see pump labeling to determine class of protection)
	Terminal for connection of an equipotential conductor
Drip Proof IPX1	Equipment protected against dripping water
	Attention! Consult accompanying documents
Fluids and Cleaning:	Infusion system is not affected by fluid spills or common cleaning solutions
Operating Environment:	10° to 40° C (50° to 104° F), 10% to 90% relative humidity
Shipping/Storage Environment:	-20° to 60° C (-4° to 140° F), 10% to 90% relative humidity
Occlusion Alarm Pressure Limit:	Selectable from 7 to 55 kPa (1 to 8 psig)
Maximum Occlusion Pressure	128 kPa (18 psig, approximate)
Delivery Rate Accuracy:	± 5% in typical clinical use

DELIVERY RATE RANGE

Micro Mode: 0.1 to 99.9 mL/hr (in 0.1 mL increments; total primary rate plus secondary rate cannot exceed 99.9 mL/hr). In the concurrent mode, the rates for either primary or secondary cannot be less than 0.5 mL/hr

Macro Mode: 1 to 999 mL/hr (in 1 mL increments). In the concurrent mode, total primary rate plus secondary rate cannot exceed 700 mL/hr

DOSE LIMIT RANGE

Micro Mode: 0.1 to 999 mL (in 0.1 mL increments)

Macro Mode: 1 to 9999 mL (in 1 mL increments)

AIR-IN-LINE ALARM

Distal: STOPPED AIR IN DISTAL LINE alarm sounds if a bubble 100 microliters or larger passes the distal air-in-line sensors. (Alarm may sound at detection of a bubble as small as 50 microliters)

Proximal: STOPPED AIR IN PROXIMAL LINE alarm sounds if a bubble approximately 1200 microliters or larger passes through the proximal air-in-line sensors

Section 9

DRAWINGS

Figure 9-1 through *Figure 9-23* detail the infusion system through illustrated parts breakdown (IPB), interconnect, and schematic diagrams. *Table 9-1, Drawings*, lists drawings by figure number, title, and part number. *Table 9-2, IPB for the Infusion System*, identifies infusion system parts by index numbers that correlate to *Figure 9-1, IPB for the Infusion System*.

Note: Figures listed in *Table 9-1* are rendered as graphic representations to approximate actual product; therefore, figures may not exactly reflect the product. Drawings and schematics in *Section 9* are provided as information only; drawings and schematics may not exactly reflect current product configuration.

Table 9-1. Drawings

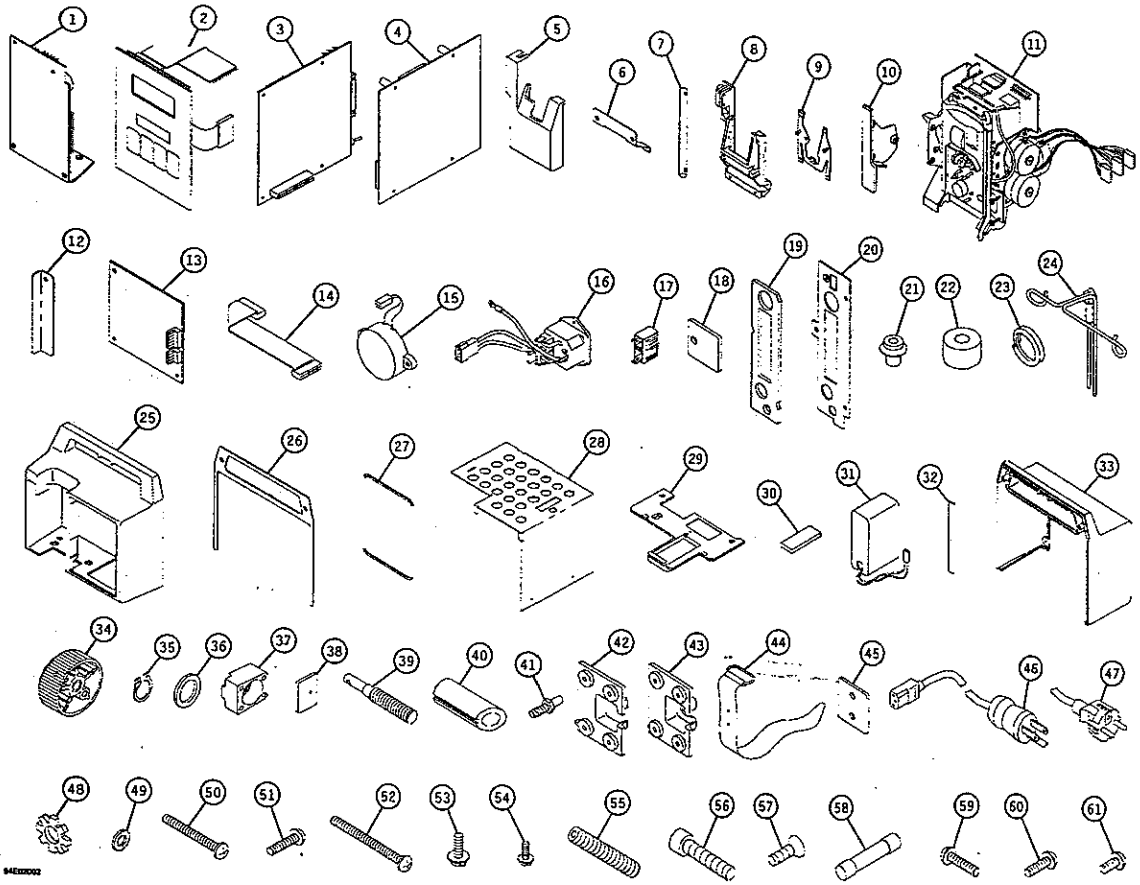
Figure Number	Title	Drawing Number
Figure 9-1	IPB for the Infusion System (5 Sheets)	N/A
Figure 9-2	1.5 Series Interconnect Schematic	249-03100-001
Figure 9-3	1.6 Series Interconnect Schematic	249-03100-002
Figure 9-4	1.6 Series Battery Charger PWA Schematic	249-03644-002
Figure 9-5	LED Display PWA Schematic	249-03313-002
Figure 9-6	1.5 Series I/O PWA Schematic	249-03305-012
Figure 9-7	1.6 Series I/O PWA Schematic	249-03305-015
Figure 9-8	1.6 Series with DataPort I/O PWA Schematic	249-03305-016
Figure 9-9	1.5 Series Main PWA Schematic	249-03304-046
Figure 9-10	1.6 Series Main PWA Schematic	249-03304-034
Figure 9-11	1.5 Series Power Supply PWA Schematic (2 Sheets)	249-03308-005
Figure 9-12	1.6 Series Power Supply PWA Schematic (2 Sheets)	249-03308-009
Figure 9-13	Bubble Sensor PWA Schematic	249-03322-009
Figure 9-14	1.5 Series Sensor PWA Schematic	249-03110-009
Figure 9-15	1.6 Series Sensor PWA Schematic (2 Sheets)	249-03110-011
Figure 9-16	1.6 Series Junction Box PWA Schematic	249-03658-003

Table 9-1. Drawings		
Figure Number	**Title**	**Drawing Number**
Figure 9-17	1.5 Series Main PWA (International) Schematic	249-03304-057
Figure 9-18	1.6 Series Main PWA (International) Schematic	249-03304-052
Figure 9-19	1.5 Series I/O PWA (International) Schematic	249-03305-021
Figure 9-20	1.6 Series I/O PWA (International) Schematic	249-03305-022
Figure 9-21	Power Supply (International) Schematic (2 Sheets)	249-03308-010
Figure 9-22	Bubble Sensor (International) Schematic	249-03322-010
Figure 9-23	Current Boost Charger Schematic	249-03644-003

Table 9-2. IPB for the Infusion System		
Index No.	**Nomenclature**	**Replacement Procedure**
1	PWA, Power Supply	*Section 7.2.18.1* or *Section 7.2.19.1*
2	Panel, Front (Sheets 1 and 3)	*Section 7.2.16*
2A	Sub-Panel	N/A
2B	Assembly, LCD, 1.6	*Section 7.2.16.2*
2C	PWA, Display, LC5000(CC)	*Section 7.2.16.1*
2D	Spacer, Round, .250 O.D. x .140 I.D. x .25 LG	N/A
2E	Nut, 4-40, KEP w/CNCL Washer, Small	N/A
2F	Spacer, LCD	N/A
2G	Washer, Lock #2, .020 THK SPL, C, STL	N/A
2H	Nut, 2-56, Hex, CD PL, SML SER	N/A
3	PWA, I/O LC5000, w/DataPort	*Section 7.2.19.2*
4	PWA, Main, Rev. 1.6 w/DataPort	*Section 7.2.17.1*
5	Cover, Door	*Section 7.2.23.1*
6	Spring, Loading, Door Hinge	*Section 7.2.23.2*
7	Shaft, Cassette, Door	*Section 7.2.23.3*

Table 9-2. IPB for the Infusion System		
Index No.	**Nomenclature**	**Replacement Procedure**
8	Base, Casting, Door	*Section 7.2.23.4*
9	Assembly, Leaf Spring/Retainer, Door	*Section 7.2.21*
10	Handle, Door	*Section 7.2.20*
11	Assembly, Mechanism	*Section 7.2.18.2* or *Section 7.2.19.2*
12	Bracket, Holddown	*Section 7.2.19.3*
13	PWA, Cov Bst, Charger	*Section 7.2.19.3*
14	Assembly, Cable, Ribbon Sensor-To-I/O	*Section 7.2.24*
15	Assembly, Piezoelectric Alarm	*Section 7.2.25*
16	Assembly, AC Receptacle	*Section 7.2.26*
17	Drawer, Fuse, 2-Pole	*Section 7.2.5*
18	Cover, DIP, Switch	*Section 7.2.8*
19	Gasket, I/O Pump	N/A
20	Panel, I/O, Port	*Section 7.2.8*
21	Insert, Foot	*Section 7.2.9*
22	Bumper, Rubber, 0.563 Diameter x 0.383 High	N/A
23	Ring, Cotter	*Section 7.2.12.1*
24	Assembly, Minipole (Sheets 1 and 5)	*Section 7.2.12*
24A	Bag Hanger	*Section 7.2.12.2*
24B	Clutch Housing	*Section 7.2.12.3*
24C	Clutch Spring	*Section 7.2.12.4*
25	Cover, Front	*Section 7.2.13*
26	Gasket, Cover, Front	N/A
27	Gasket, Front Panel	N/A
28	Shield, EMI	*Section 7.2.14*
29	Cover, Floor, Enclosure	*Section 7.2.2*

Table 9-2. IPB for the Infusion System		
Index No.	**Nomenclature**	**Replacement Procedure**
30	Pad, Battery	N/A
31	Assembly, Battery w/Wire, Harness	*Section 7.2.2*
32	Gasket, Heatsink, Rear Cover	N/A
33	Cover, Rear	*Section 7.2.13*
34	Knob, Pole Clamp	*Section 7.2.7.1*
35	Grip-Ring, 0.312, SFT, SS	N/A
36	Washer, Flat, 0.328 I.D. x 0.567 O.D. x 0.06 Thick	N/A
37	Retainer, Shaft, Pole Clamp	*Section 7.2.7.2*
38	Assembly, Plate, Friction, Pole Clamp	*Section 7.2.7.3*
39	Screw, Pole Clamp	*Section 7.2.7.2*
40	Clamp, Shaft, Pole	*Section 7.2.7.2*
41	Equipotential, Terminal (International)	N/A
42	Cover, Line Plug (International)	*Section 7.2.3*
43	Cover, Line Plug	*Section 7.2.3*
44	Strap, Velcro Hook and Loop, Light Gray	Section 7.2.6
45	Plate, Backing, Retainer, Cord	*Section 7.2.3* and *Section 7.2.6*
46	Cordset, AC, Hospital Grade, Detachable	*Section 7.2.3*
47	Cordset, AC, Hospital Grade, Detachable (International)	*Section 7.2.3.1*
48	Washer, Lock, #6 EXT TTH	N/A
49	Washer, Lock, Split, Helical Spr	N/A
50	Screw, 6-32 x .875, PNHD, PH, SS	N/A
51	Screw, 6-32 x .50, PNHD, PH, SS	N/A
52	Screw, 6-32 x 1.25, PNH, PHH	N/A
53	Screw, 6-32 x 5/16 HH, SLTD, w/Washer	N/A



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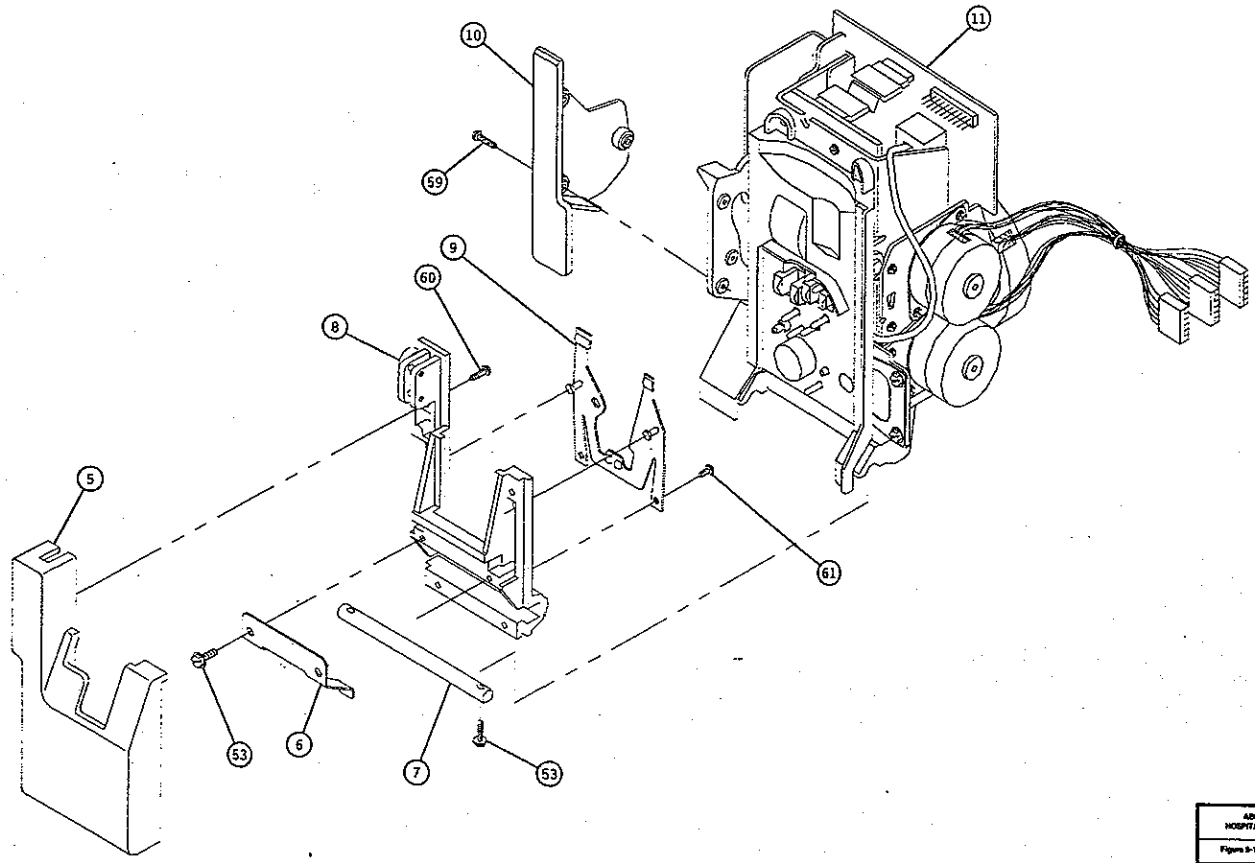
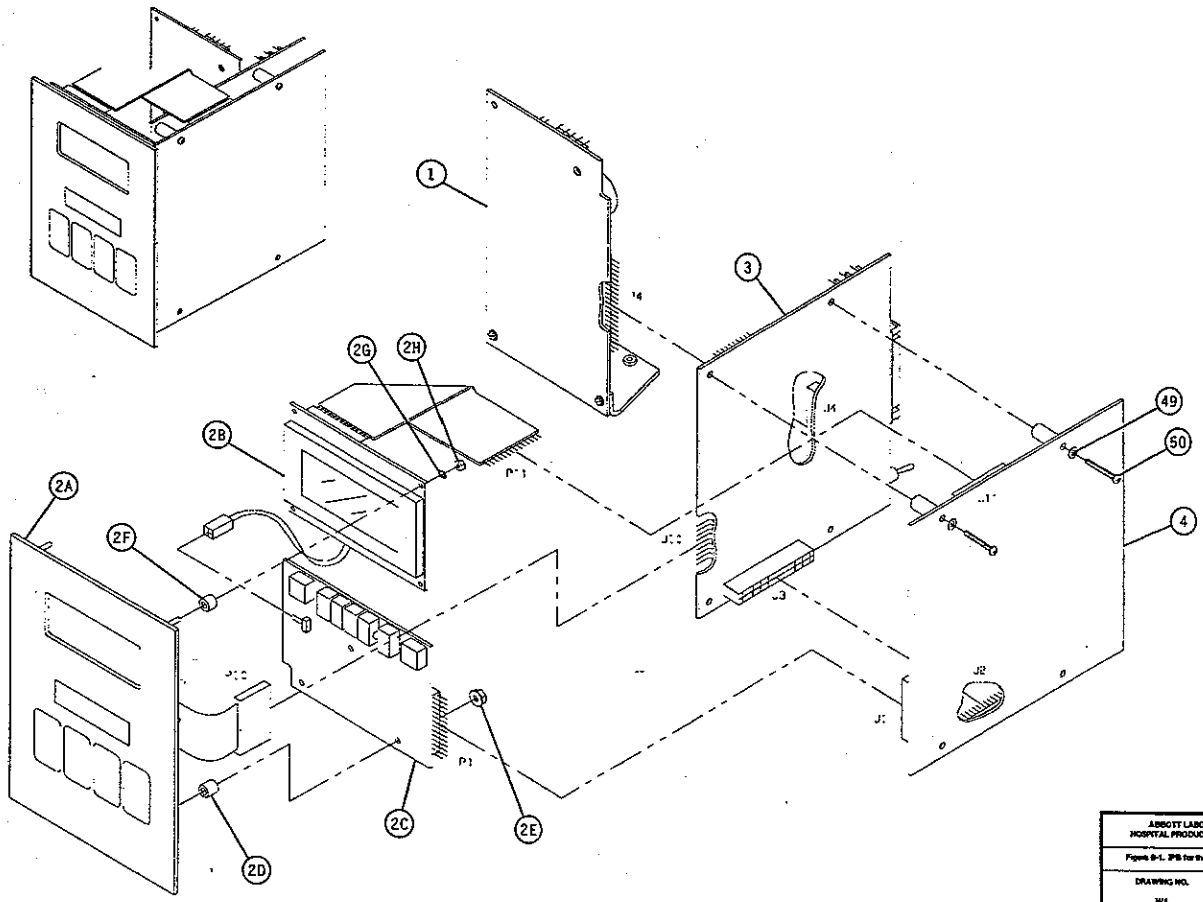
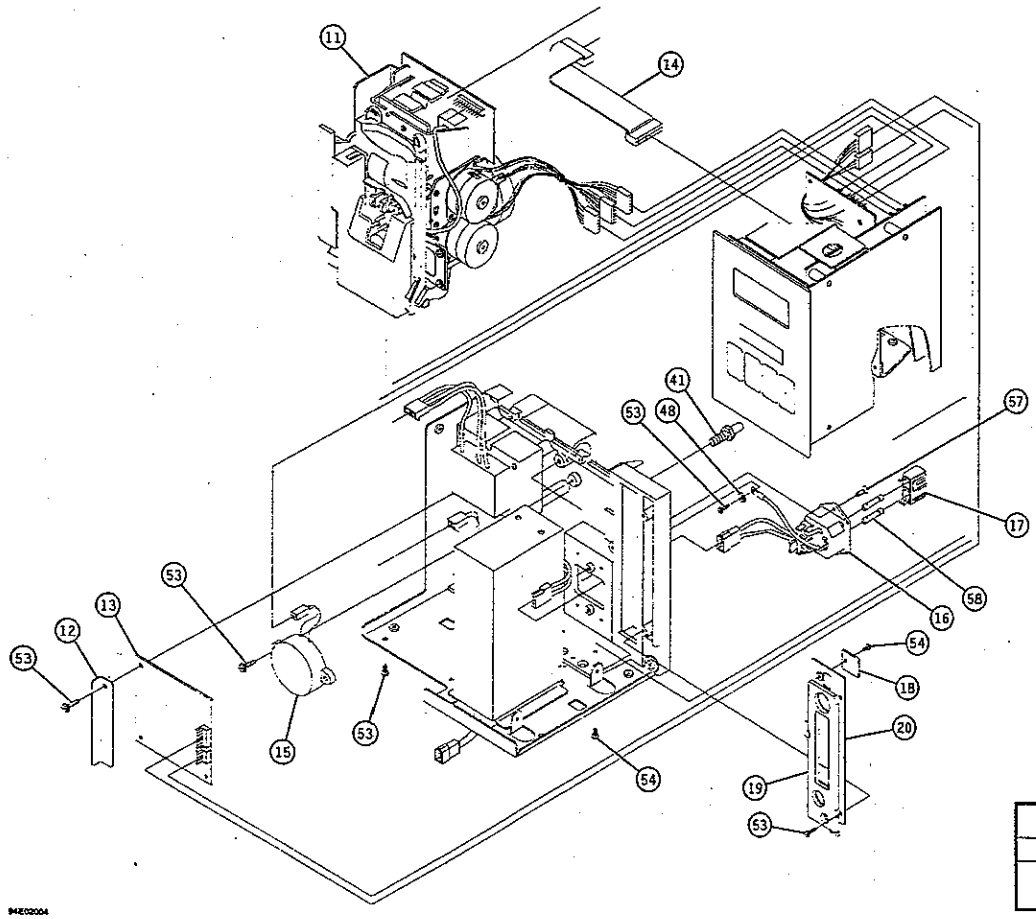
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IVY	
Figure 9-1. IPB for the Infusion System	
DRAWING NO. N/A	REV. N/A
	SHEET 1 OF 1



ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IVY	
Figure 9-1. IPB for the Infusion System	
DRAWING NO.	REV. N/A
N/A	SHEET 2 OF 5

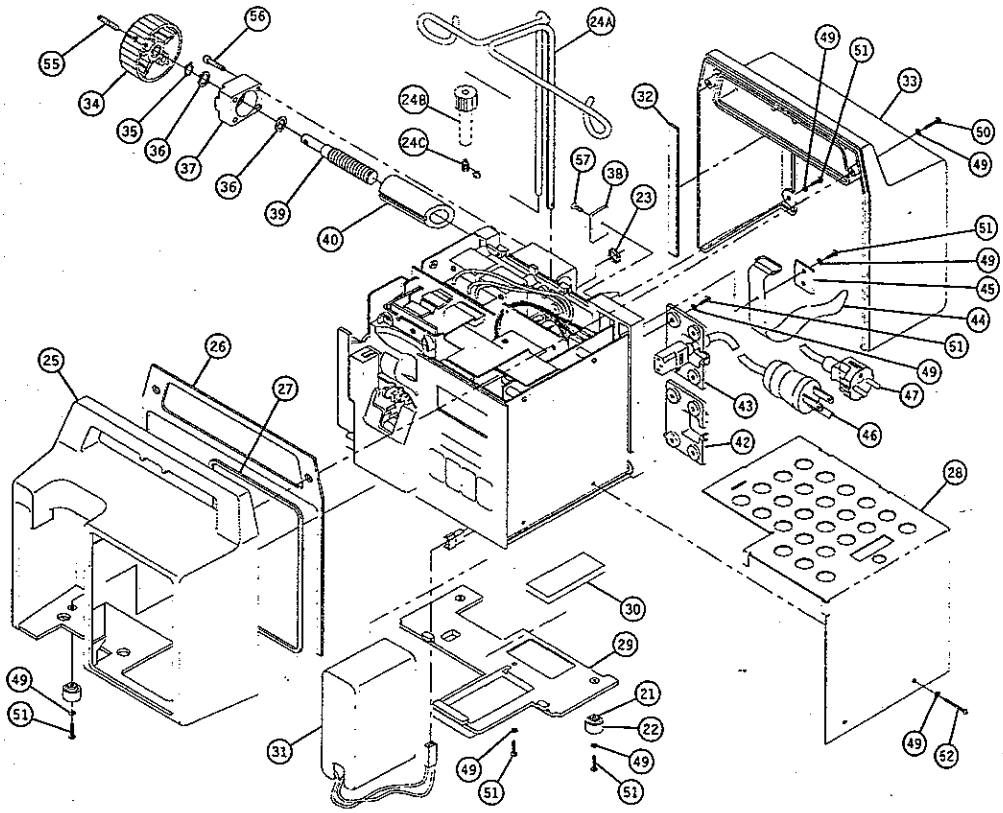


ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IMV	
Figure 9-1. IPB for the Infusion System	
DRAWING NO. N/A	REV. N/A
	SHEET 2 OF 5



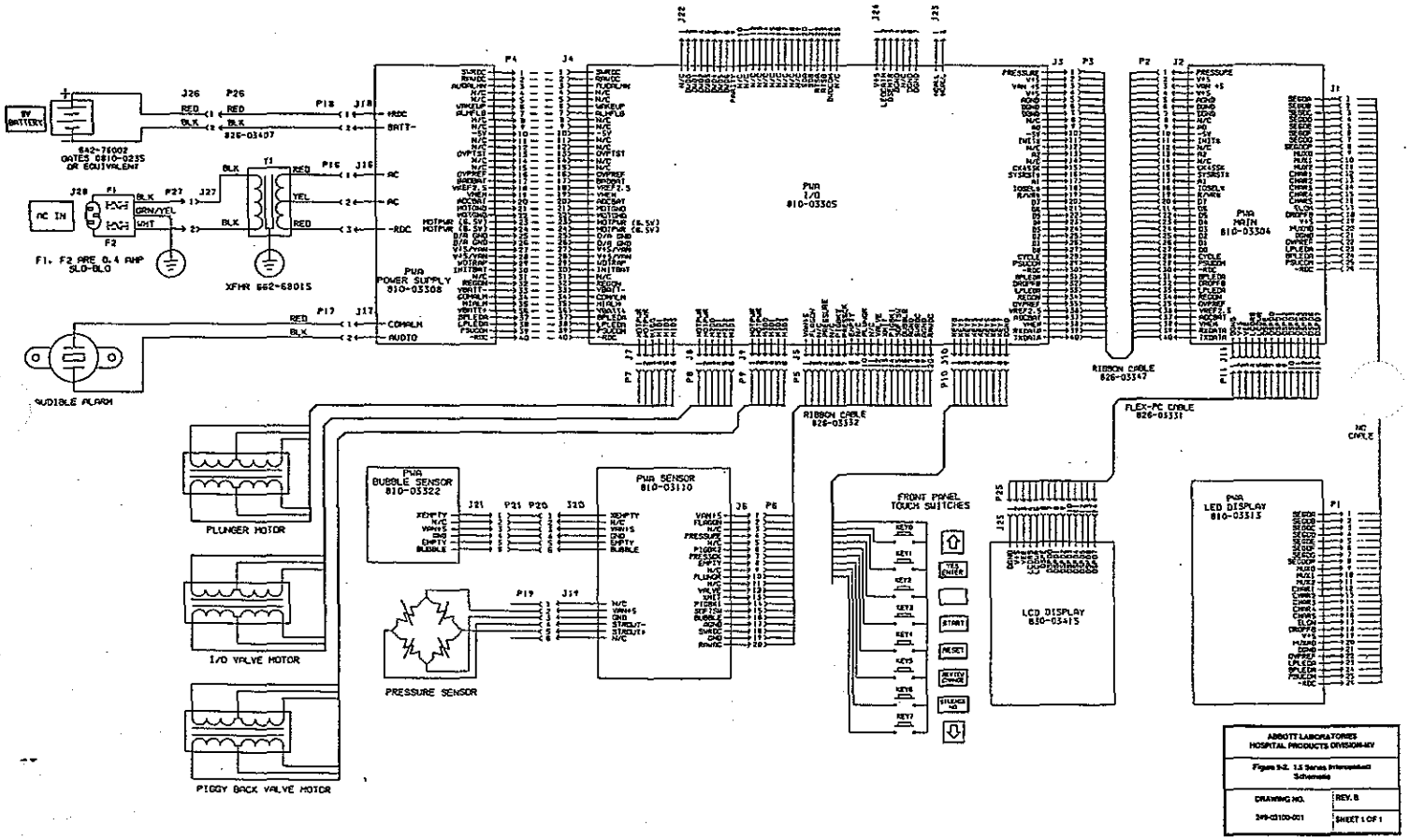
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-MV	
Figure 9-1. IPB for the Infusion System	
DRAWING NO. N/A	REV. N/A
	SHEET 4 OF 5

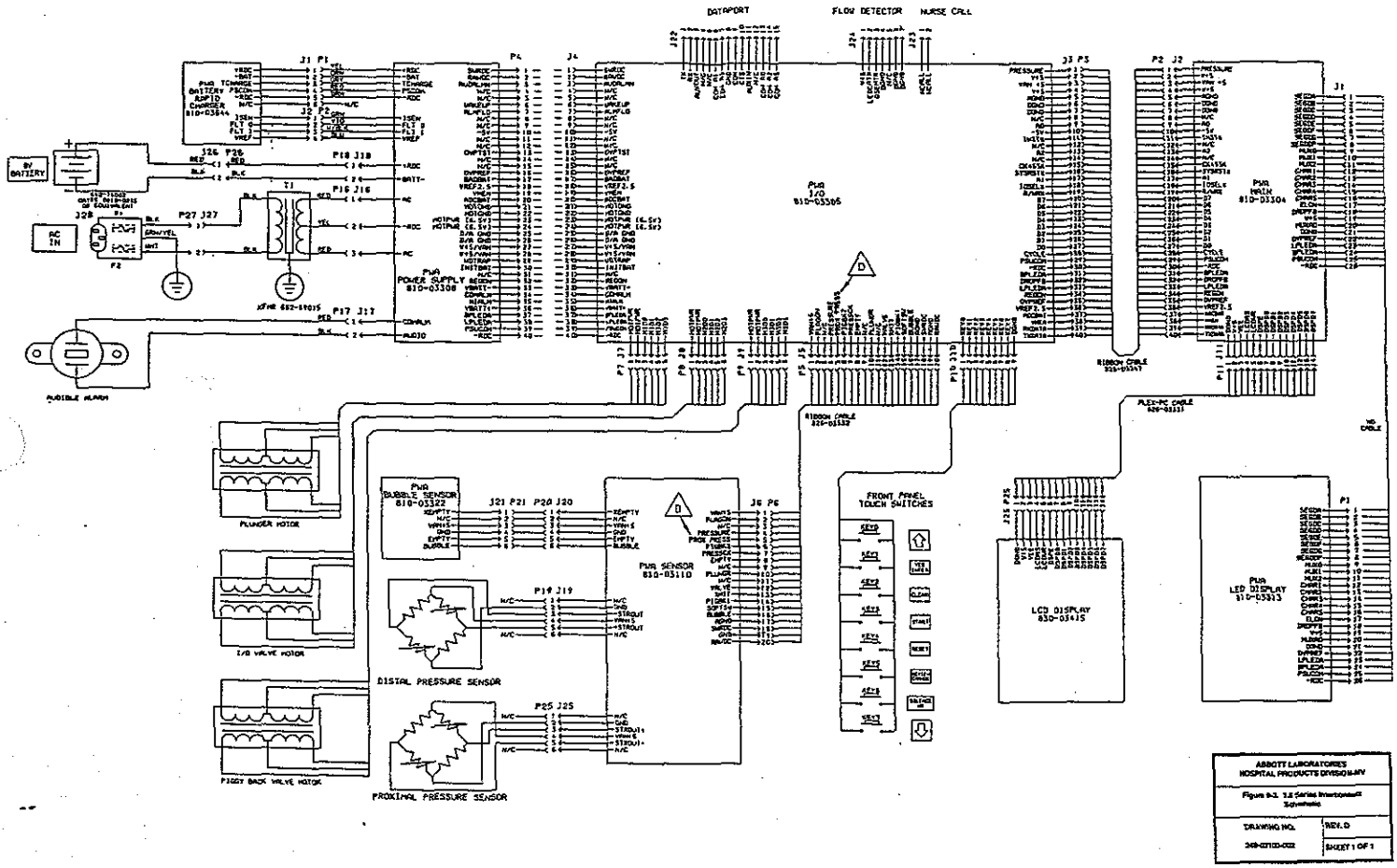
94E02004



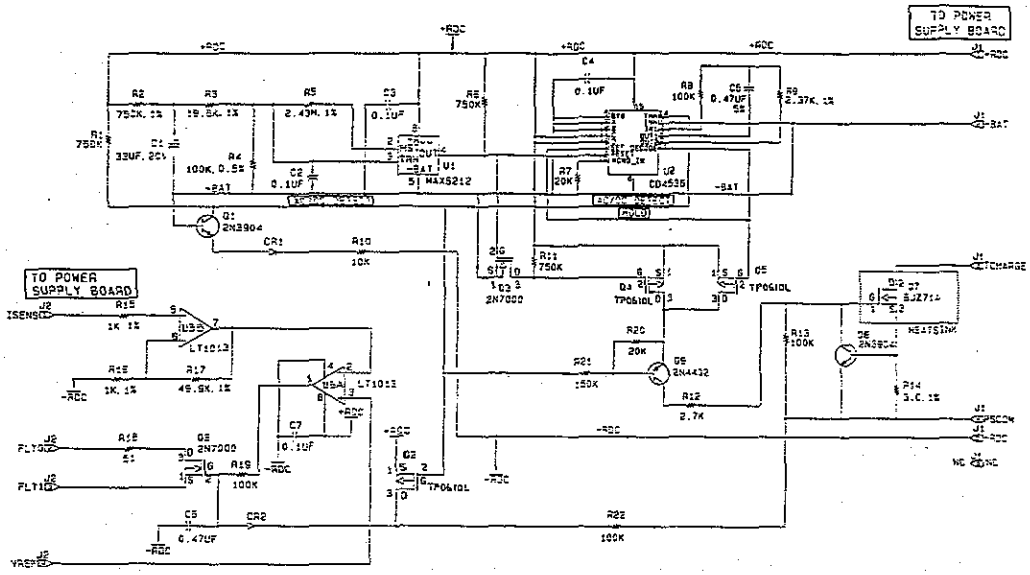
94E02005

ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IRV	
Figure 5-1. IPB for the Infusion System	
DRAWING NO.	REV. N/A
N/A	SHEET 5 OF 5

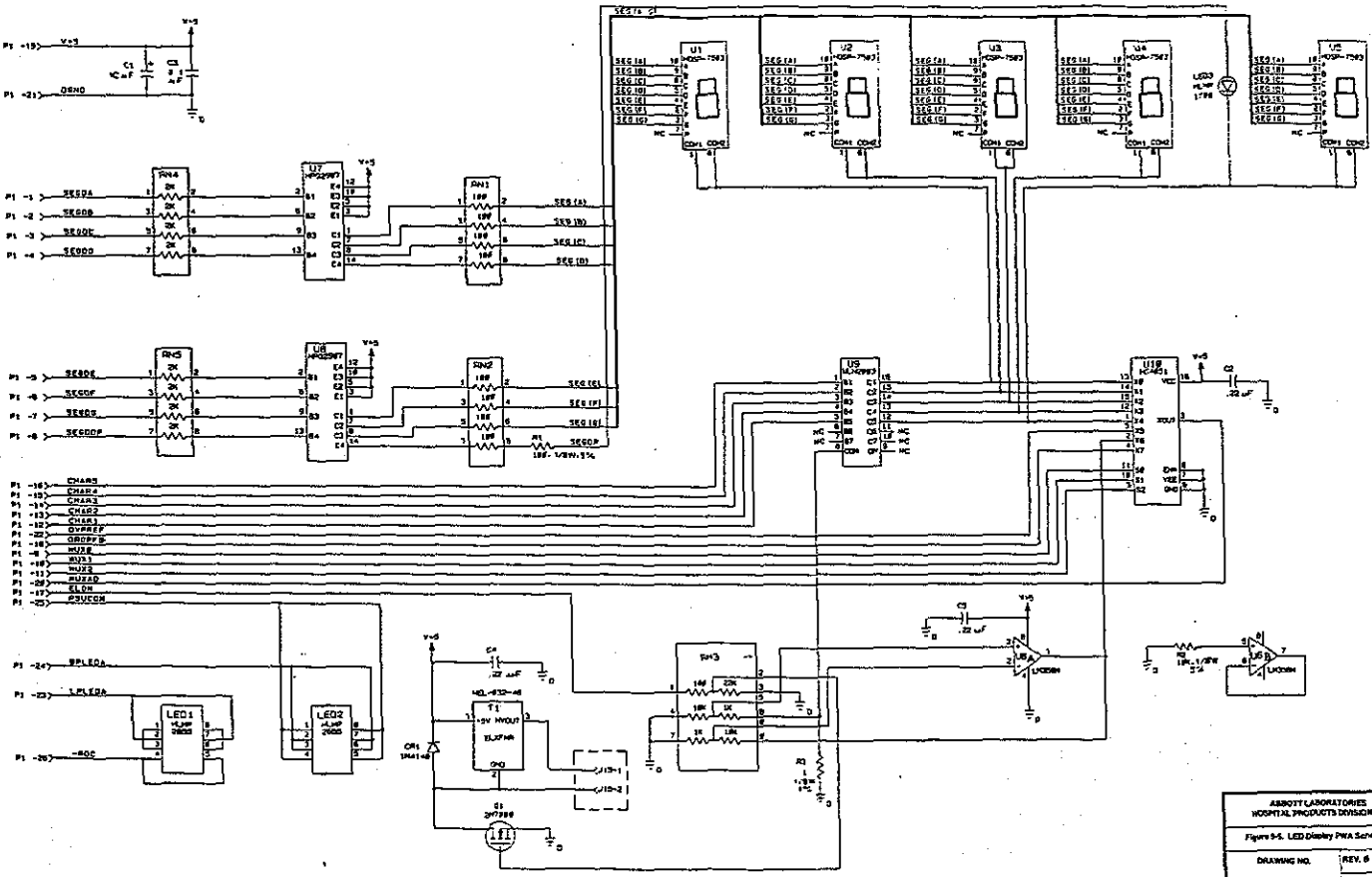

PWA
I/O
810-03305
PWA
MAIN
810-03304
PWA
POWER SUPPLY
810-03308
PWA
BUBBLE SENSOR
810-03322
PWA SENSOR
810-03110
PWA
LED DISPLAY
810-03313
LCD DISPLAY
810-03315
FRONT PANEL
TOUCH SWITCHES
RIBBON CABLE
826-03547
RIBBON CABLE
826-03332
FLEX-PC CABLE
826-03331
NC
CABLE
826-03407
XFMR 662-6801S
F1, F2 ARE 0.4 AMP
SLO-BLO
AUDIBLE ALARM
PLUNGER MOTOR
I/O VALVE MOTOR
PIGGY BACK VALVE MOTOR
PRESSURE SENSOR
ABBOTT LABORATORIES
HOSPITAL PRODUCTS DIVISION-IV
DRAWING NO.
REV. B
SHEET 1 OF 1



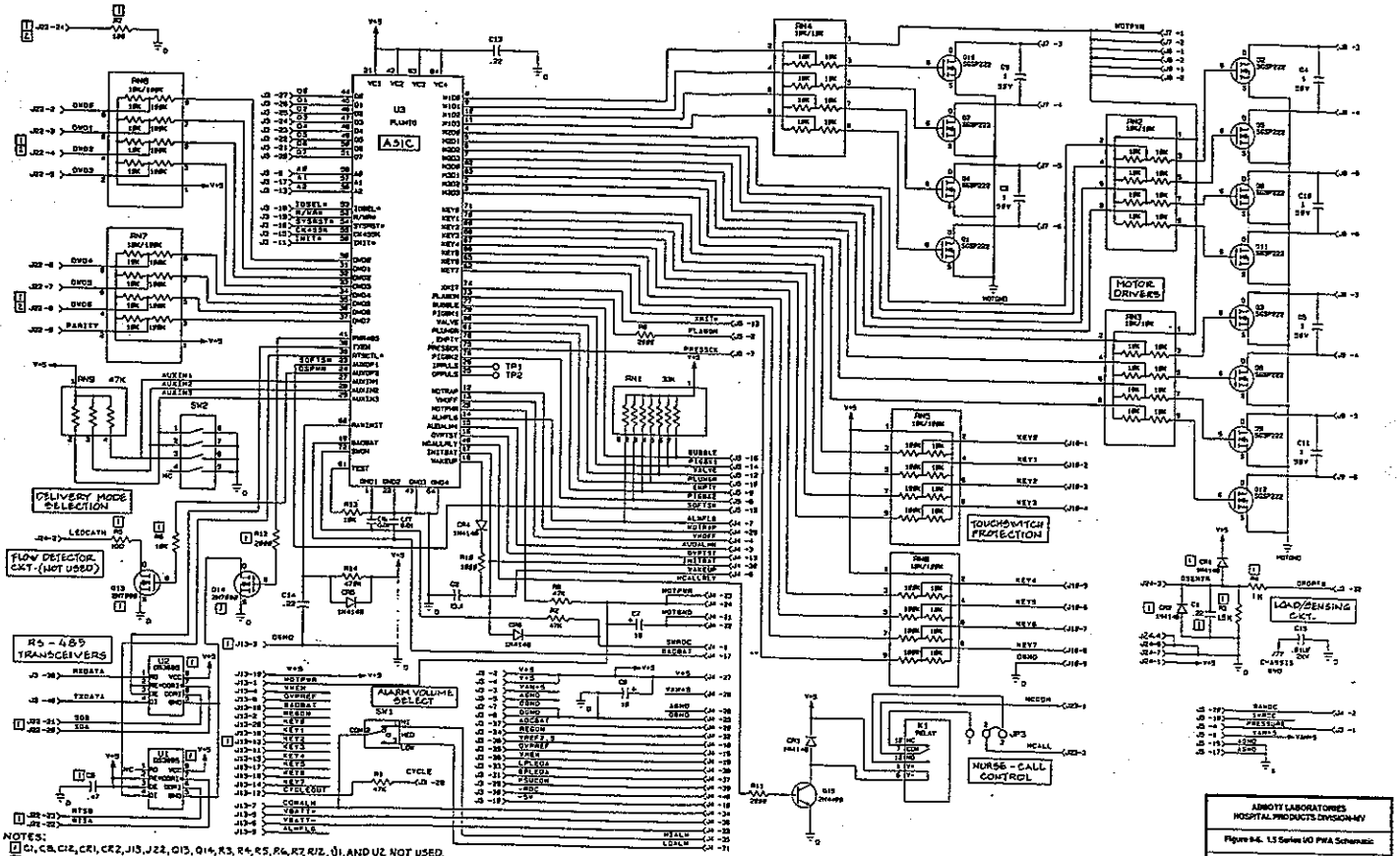
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IRV	
Figure 9-3. 3.E Series Interconnect Schematic	
DRAWING NO.	REV. D
369-03100-002	SHEET 1 OF 1



ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-MV	
Figure 9-4. 1.6 Series Battery Charger PWA Schematic	
DRAWING NO. 349-03644-002	REV. D
	SHEET 1 OF 1

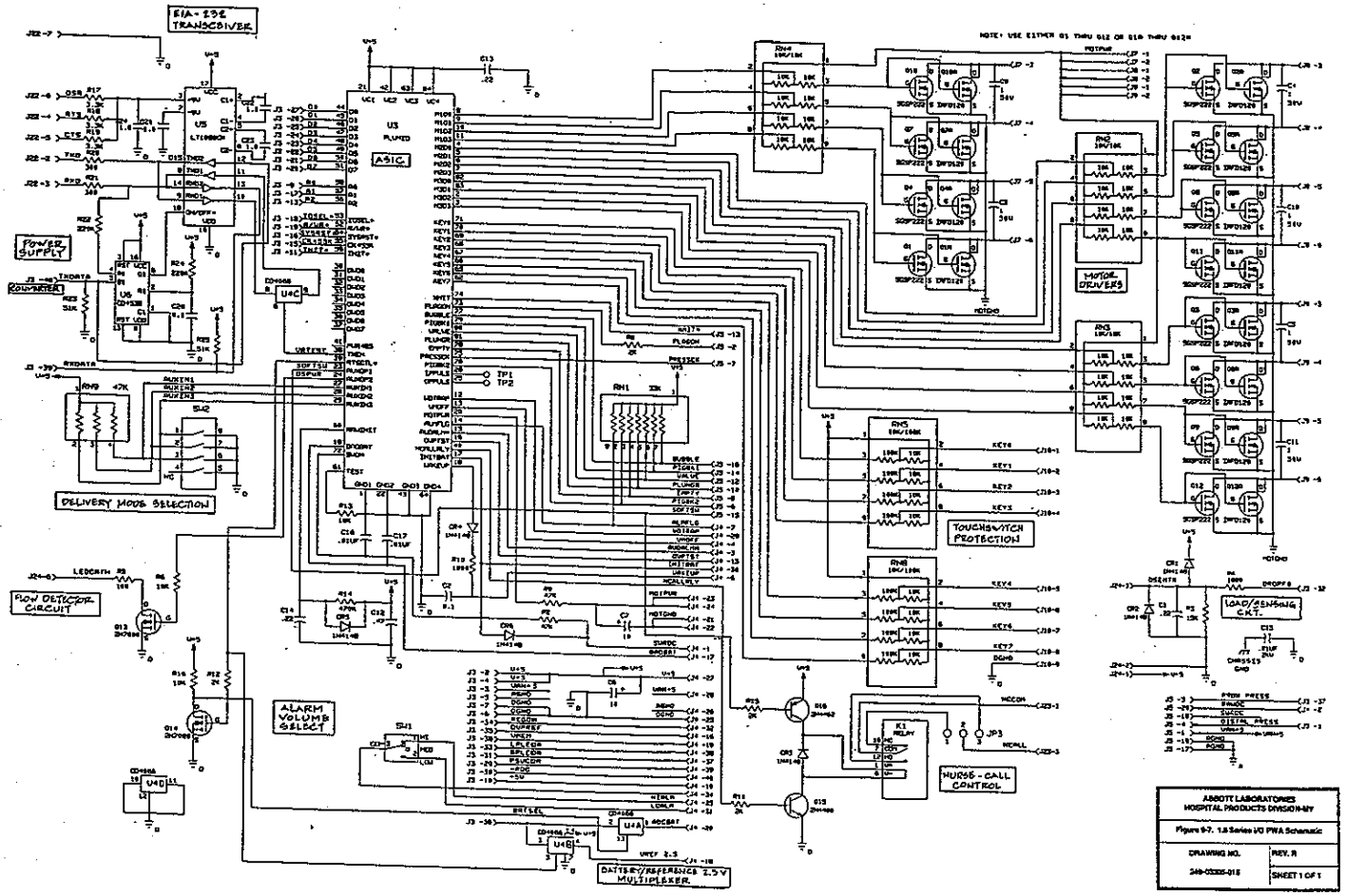


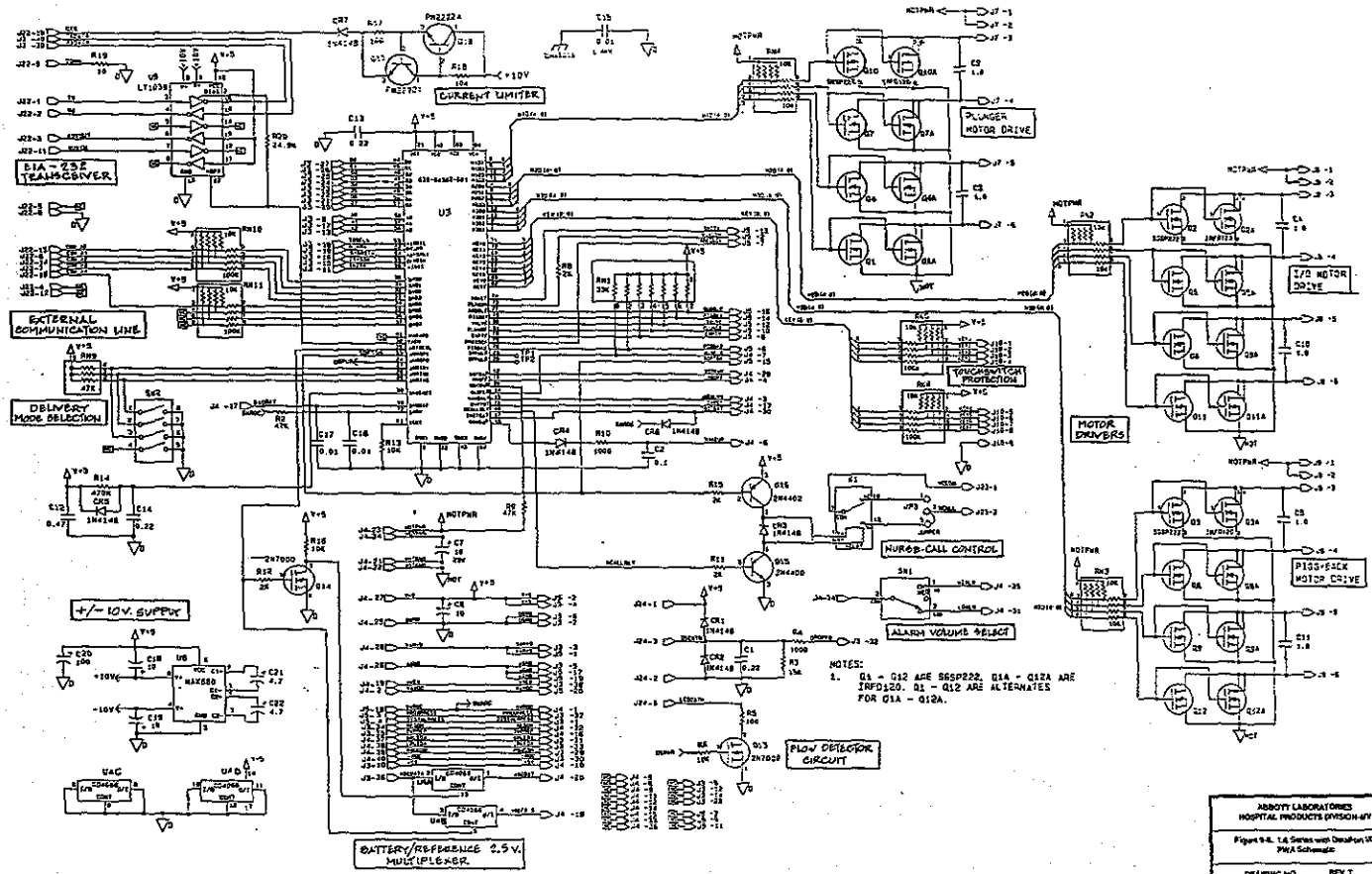
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IDY	
Figure 9-5. LED Display PWA Schematic	
DRAWING NO. 249-03313-002	REV. B SHEET 1 OF 1



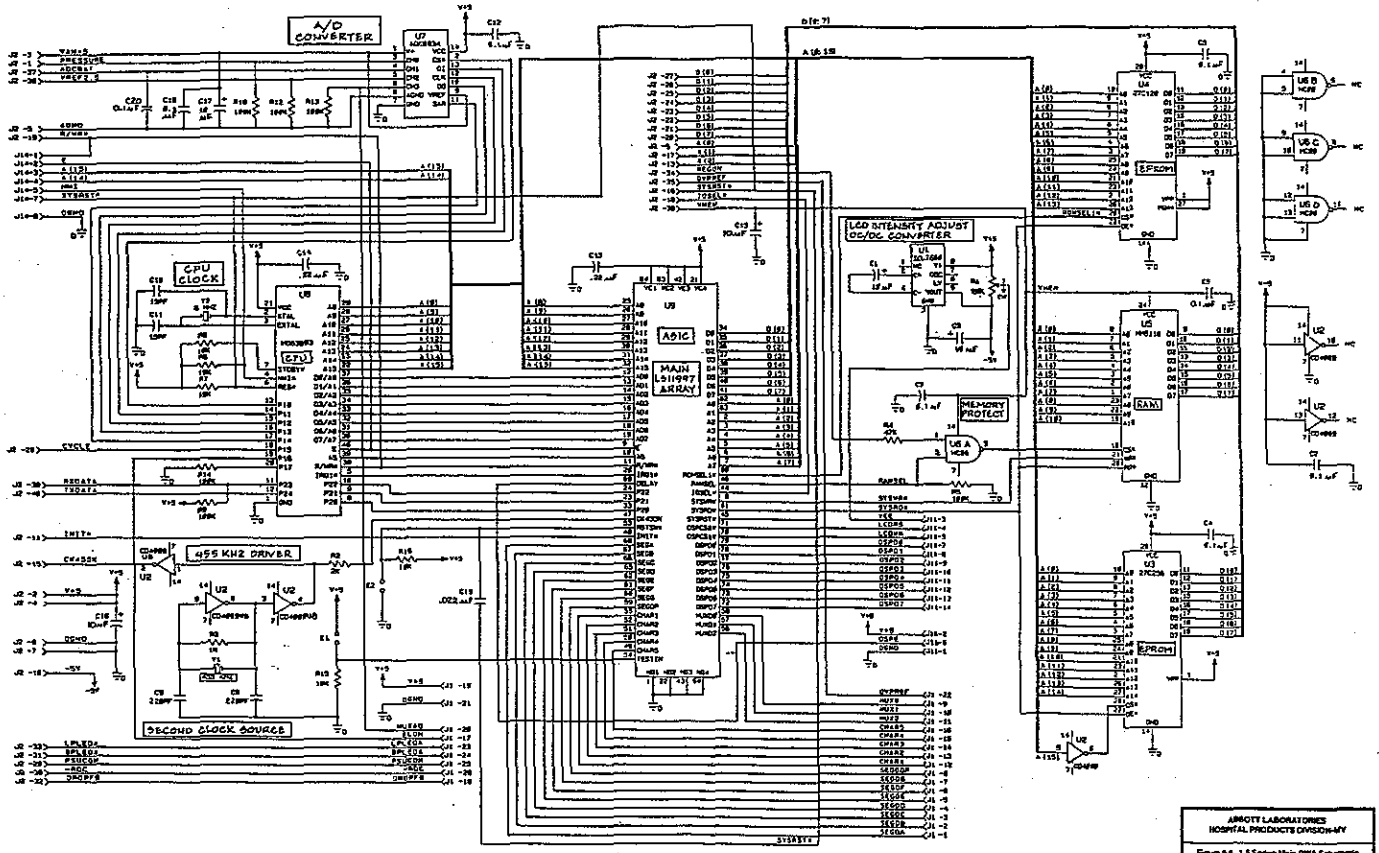
NOTES:
1. C1, C8, C12, CR1, CR2, J13, J22, Q13, Q14, R3, R4, R5, R6, R7, R12, U1, AND U2 NOT USED.
2. J22 NOT USED ON -005 PWA, BUT USED ON -010 PWA.

ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-NV	
Figure 9-6. LS Series I/O PWA Schematic	
DRAWING NO. 348-03305-012	REV. R SHEET 1 OF 1


EIA-232 TRANSCEIVER
ASIC
POWER SUPPLY
DELIVERY MODE SELECTION
FLOW DETECTOR CIRCUIT
ALARM VOLUME SELECT
MOTOR DRIVERS
TOUCH-SWITCH PROTECTION
LOAD SENSING CKT.
NURSE-CALL CONTROL
BATTERY REFERENCE 2.5V MULTIPLEXER
ABBOTT LABORATORIES
HOSPITAL PRODUCTS DIVISION-NY
DRAWING NO.
REV. R
SHEET 1 OF 1



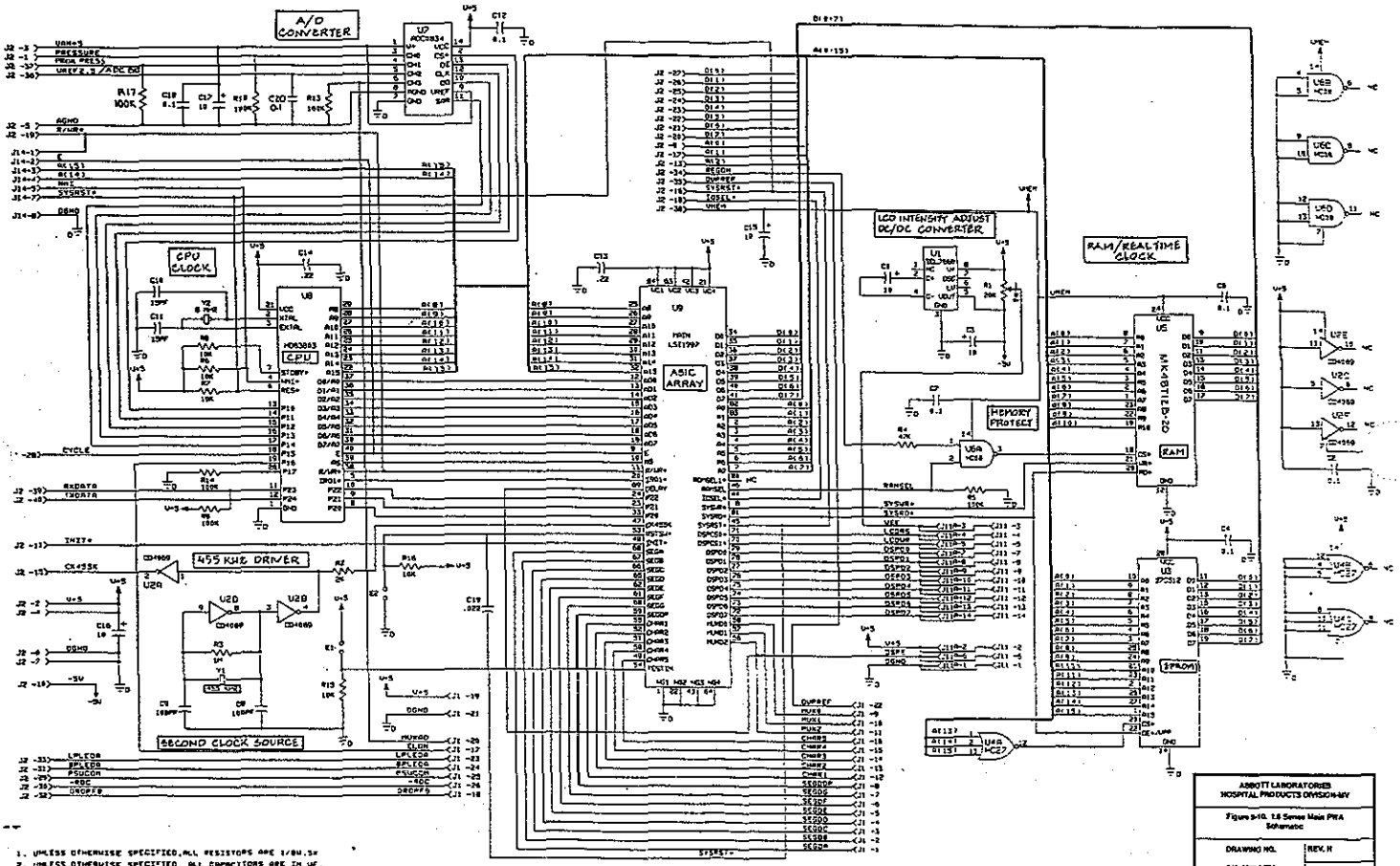
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IPD	
Figure 9-6. 1.6 Series with DrugGuard PWA Schematic	
DRAWING NO.	REV. T
349-03005-016	SHEET 1 OF 1



NOTES:

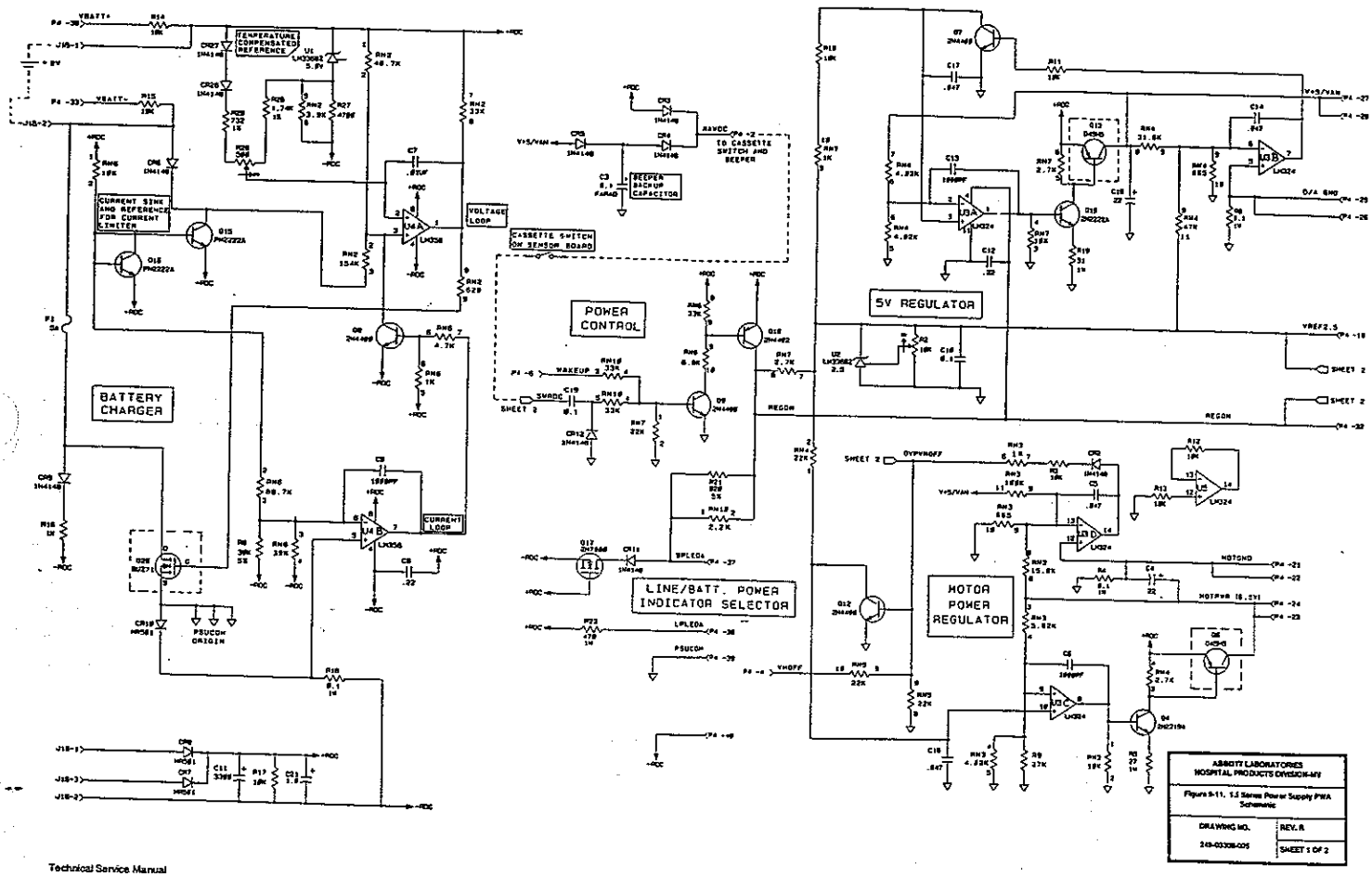
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/8W, 5%.

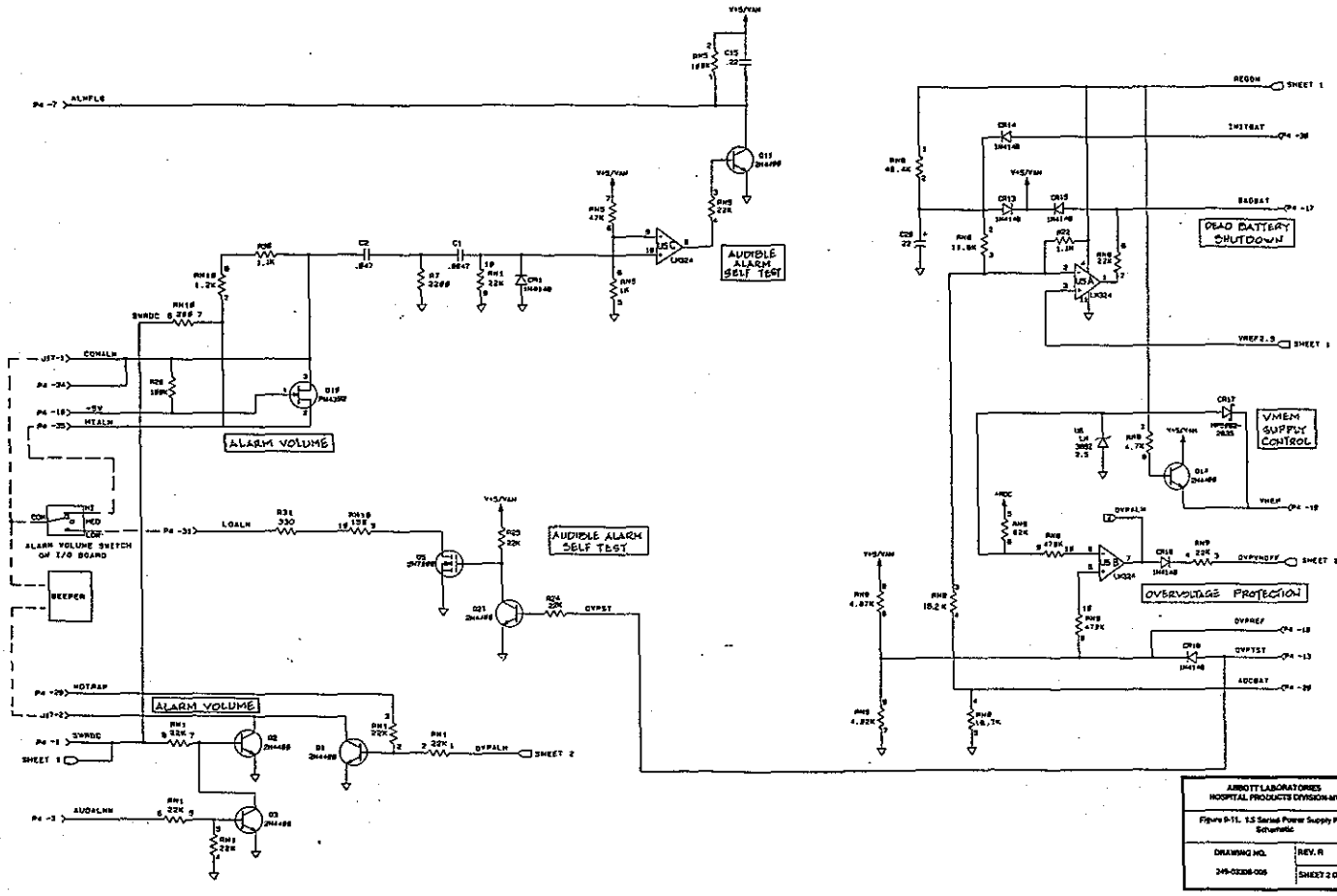
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-MV	
Figure 9-8. 1.5 Series Main PWA Schematic	
DRAWING NO. 345-03304-046	REV. H
	SHEET 1 OF 1

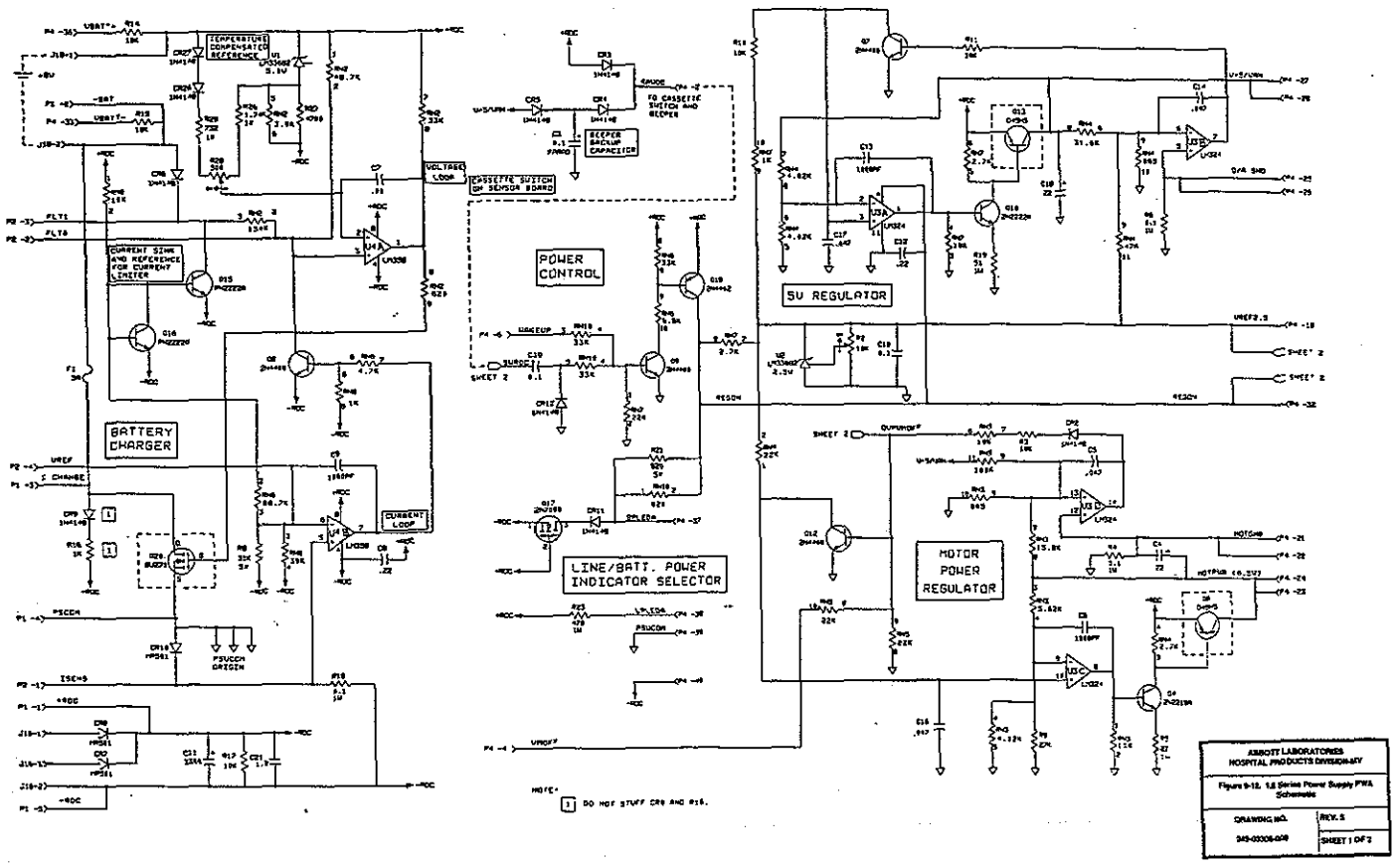


1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/8W, 5%
2. UNLESS OTHERWISE SPECIFIED, ALL CAPACITORS ARE IN UF.

NOTES:


BATTERY CHARGER
POWER CONTROL
5V REGULATOR
LINE/BATT. POWER INDICATOR SELECTOR
MOTOR POWER REGULATOR
TEMPERATURE COMPENSATED REFERENCE
CURRENT SINK AND REFERENCE FOR CURRENT LIMITER
VOLTAGE LOOP
CURRENT LOOP
CASSETTE SWITCH ON SENSOR BOARD
TO CASSETTE SWITCH AND BEEPER
BEEPER BACKUP CAPACITOR
PSUCOM ORIGIN
ABBOTT LABORATORIES
HOSPITAL PRODUCTS DIVISION-IVI
Figure 9-11. 1.5 Series Power Supply PWA Schematic
DRAWING NO.
249-03308-005
REV. R
SHEET 1 OF 2


ALARM VOLUME
AUDIBLE ALARM SELF TEST
ALARM VOLUME SWITCH ON I/O BOARD
BEEPER
AUDIBLE ALARM SELF TEST
ALARM VOLUME
DEAD BATTERY SHUTDOWN
VMEM SUPPLY CONTROL
OVERVOLTAGE PROTECTION
ABBOTT LABORATORIES
HOSPITAL PRODUCTS DIVISION-NV
Figure 9-11. 1.5 Series Power Supply PWA Schematic
DRAWING NO.
249-03208-006
REV. R
SHEET 2 OF 2

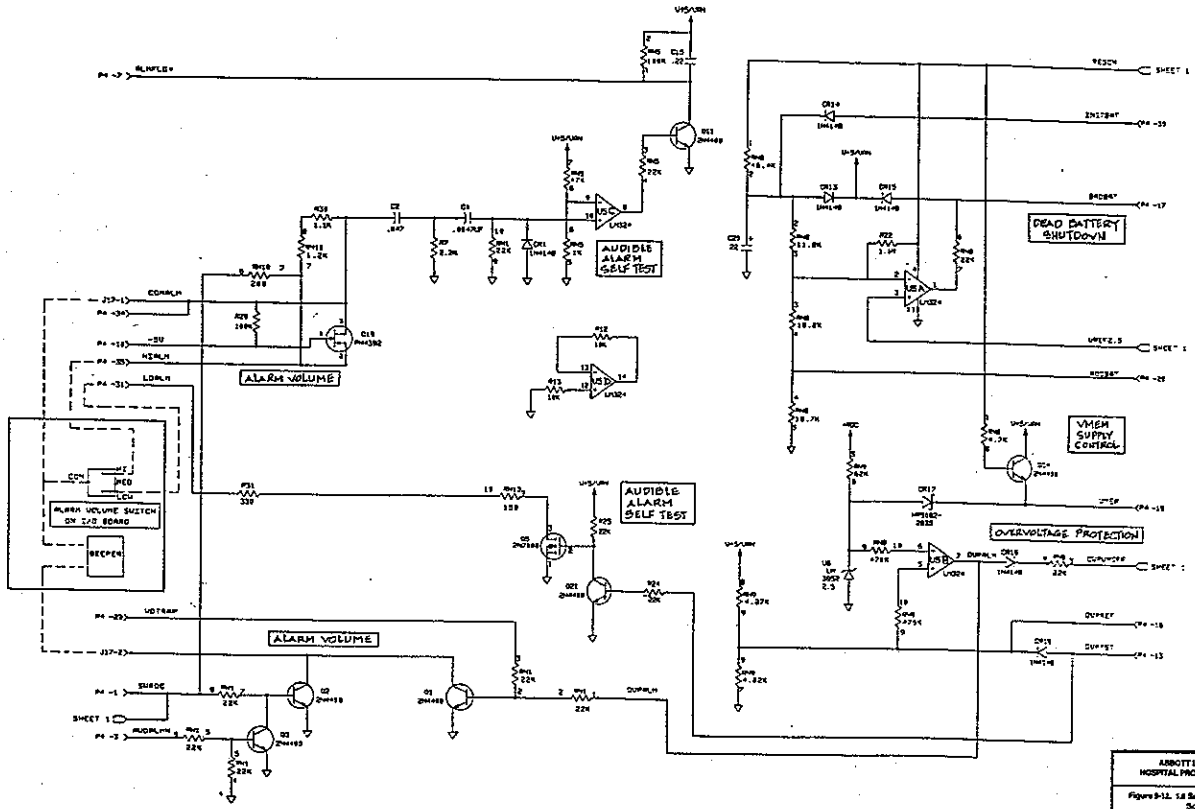


ABBOTT LABORATORIES
HOSPITAL PRODUCTS DIVISION-AP

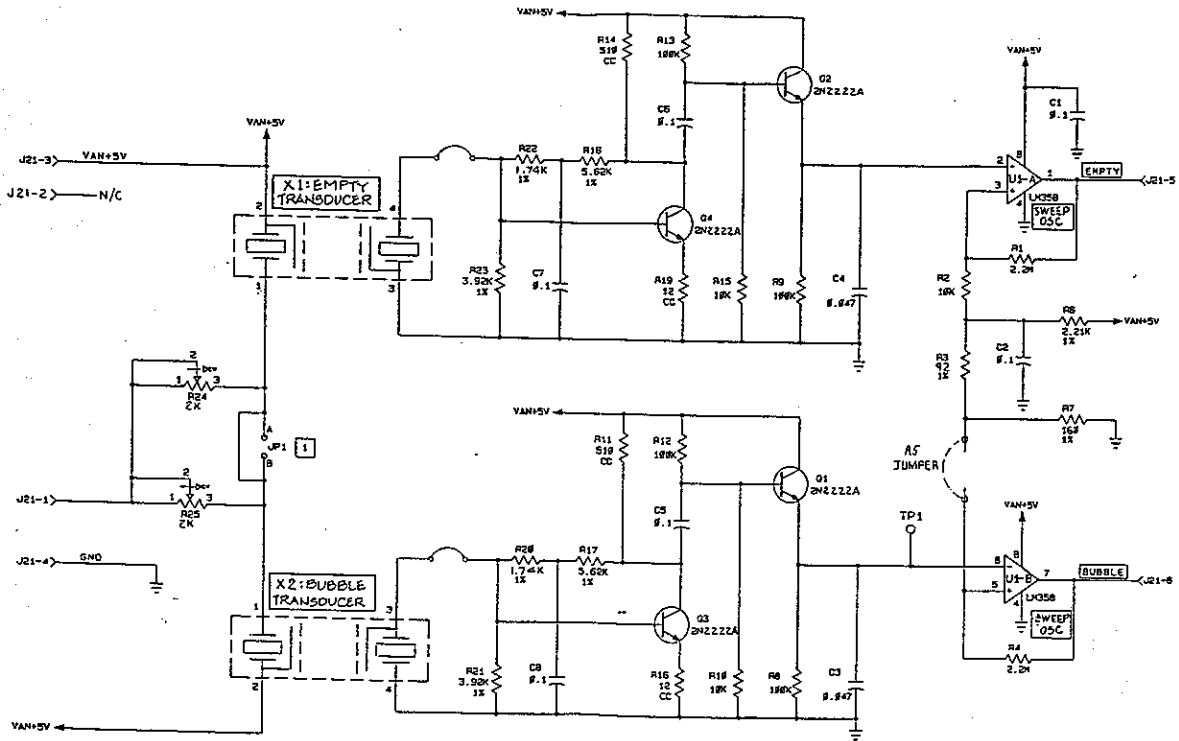
Figure 9-12. 1.0 Series Power Supply PWA Schematic

DRAWING NO. 345-03006-009 REV. S

SHEET 1 OF 2



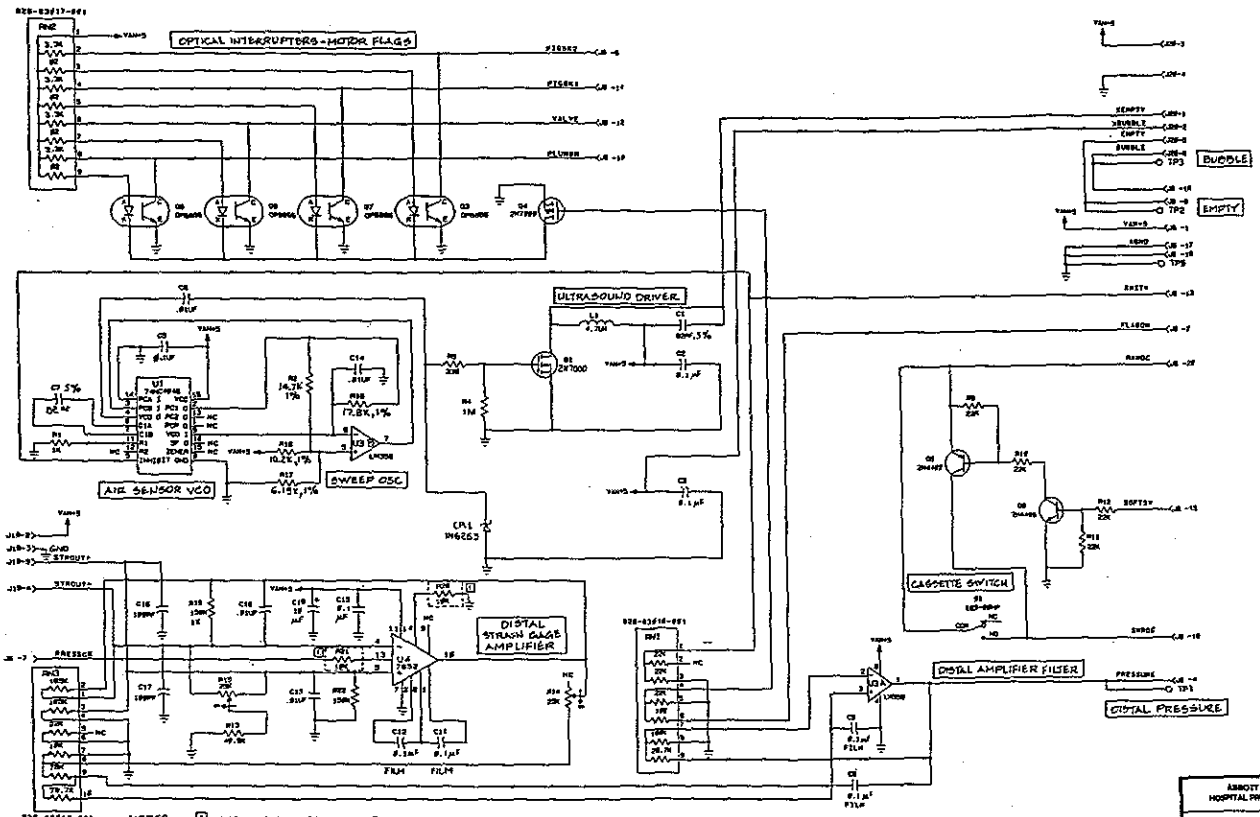
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-MV	
Figure 9-12. 1.8 Series Power Supply PWA Schematic	
DRAWING NO.	REV. S
243-03208-008	SHEET 2 OF 2



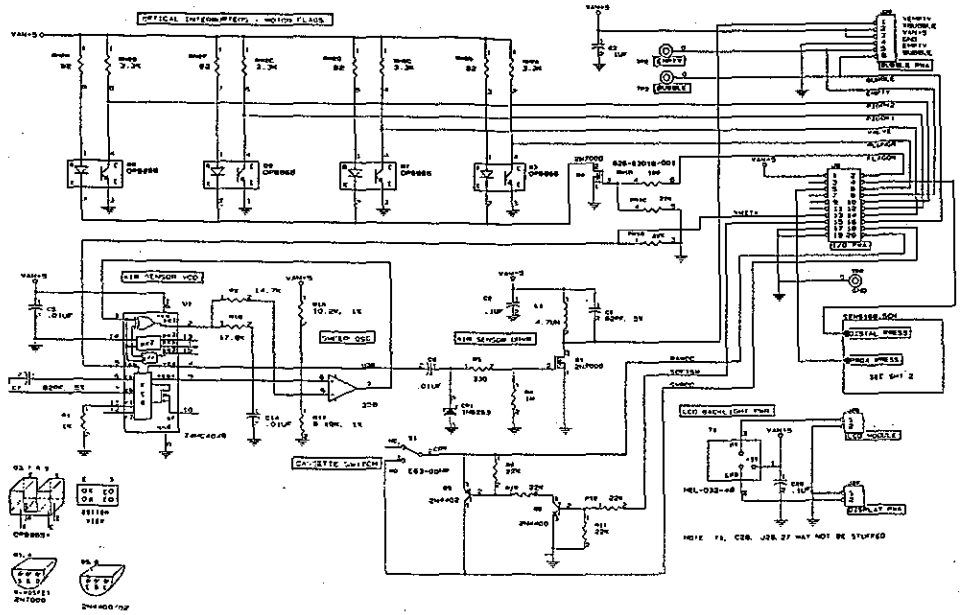
NOTES:

1. CUT TRACE BETWEEN JP1-A AND JP1-B IF R25 IS USED.
2. RESISTORS IN OHMS 5%, 1/4W UNLESS NOTED.
3. CAPACITORS IN MICROFARADS 20% UNLESS NOTED.

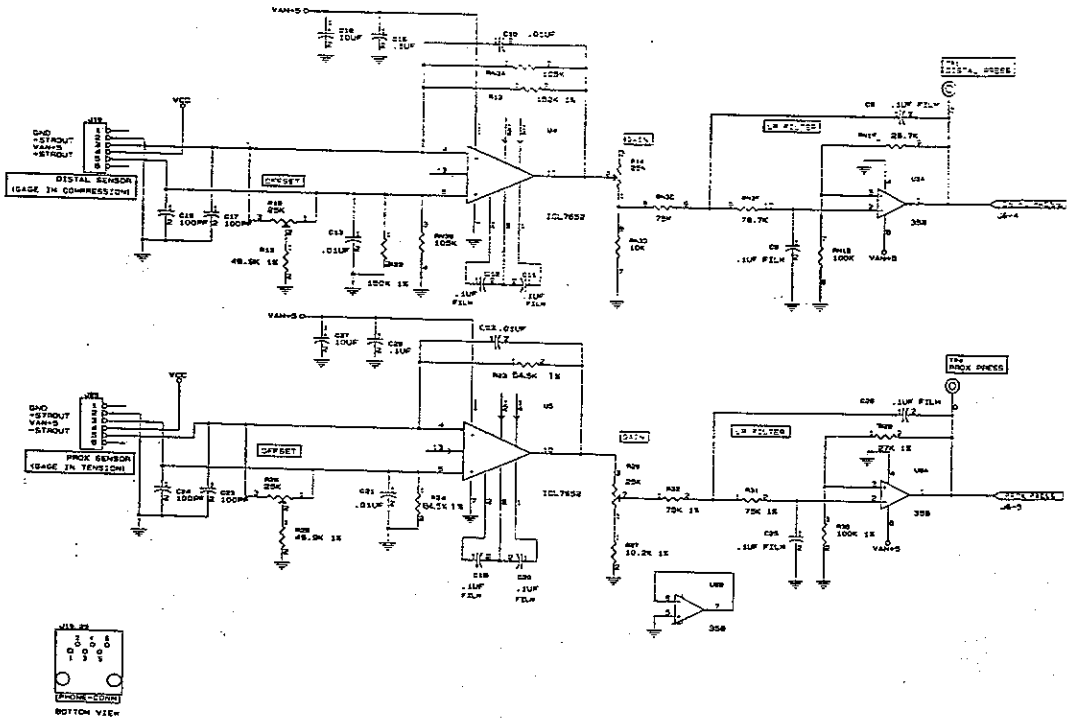
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-NY	
Figure 9-13. Bubble Sensor PWA Schematic	
DRAWING NO.	REV. K
369-02222-008	SHEET 1 OF 1



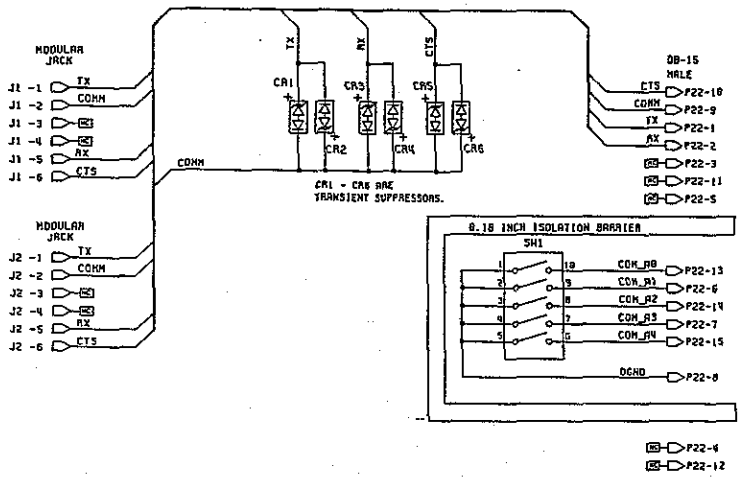
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-NV	
Figure 9-14. 1.5 Series Sensor PWA Schematic	
DRAWING NO.	REV. L
245-03110-008	SHEET 1 OF 1



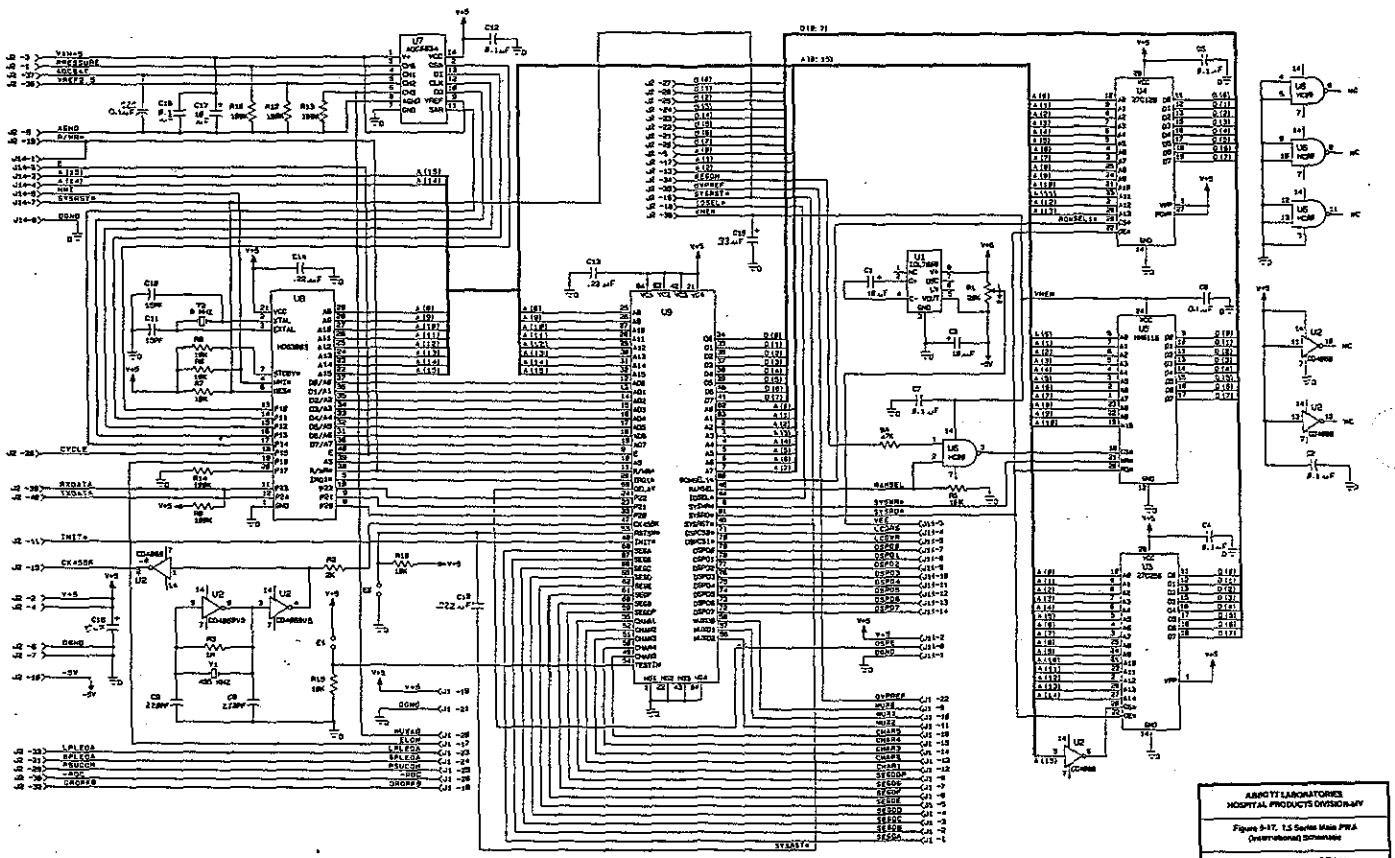
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-MPI	
Figure 9-13. I.S Series Sensor PWA Schemeas	
DRAWING NO.	REV. L
243-03110-011	SHEET 1 OF 2



ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-NV	
Figure 9-18. 1.8 Series Sensor PWA Schematic	
DRAWING NO.	REV. L
249-02110-011	SHEET 2 OF 2



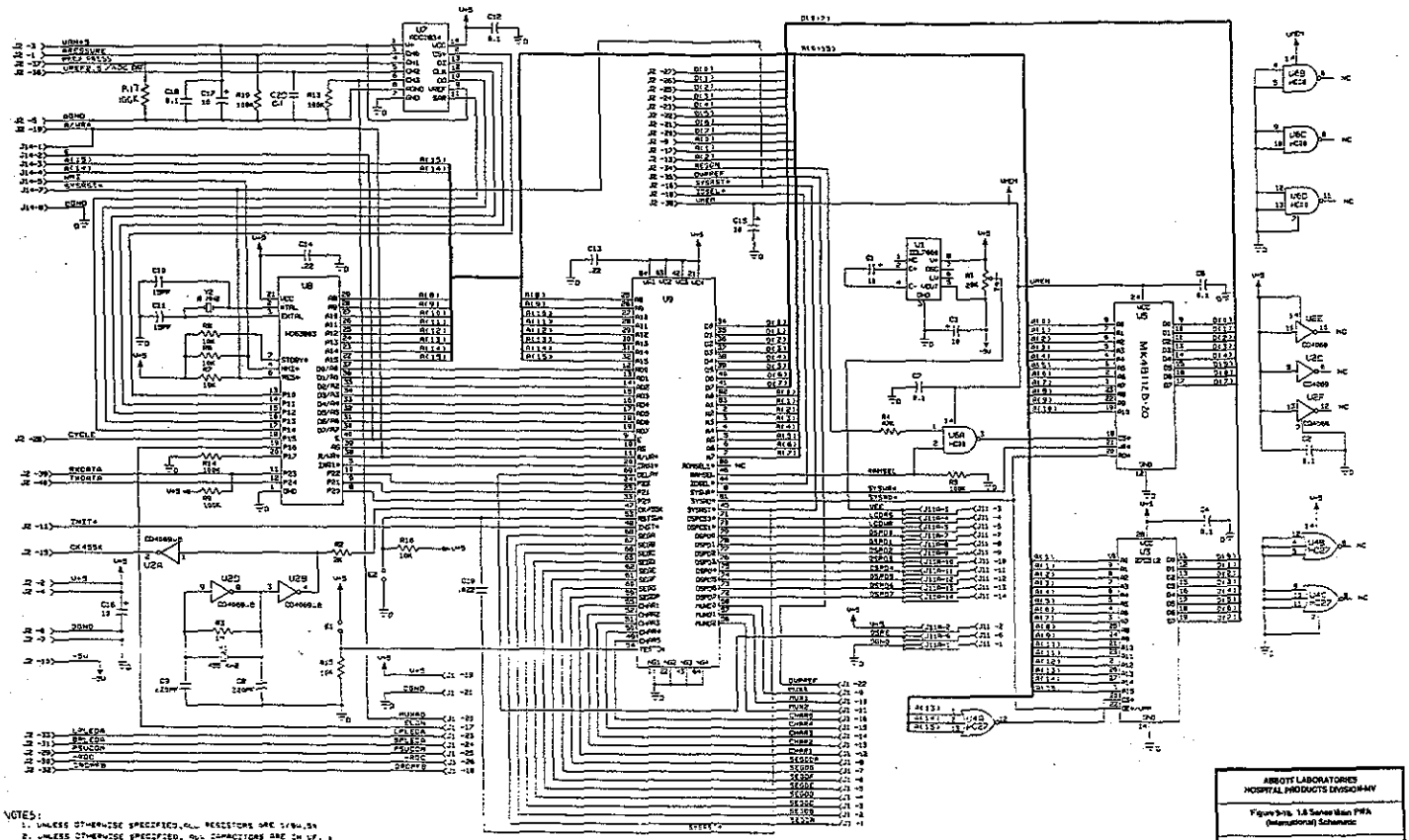
ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IMV	
Figure 9-16. I.S Series Junction Box PWA Schematic	
DRAWING NO.	REV. B
349-03654-003	SHEET 1 OF 1



NOTES:

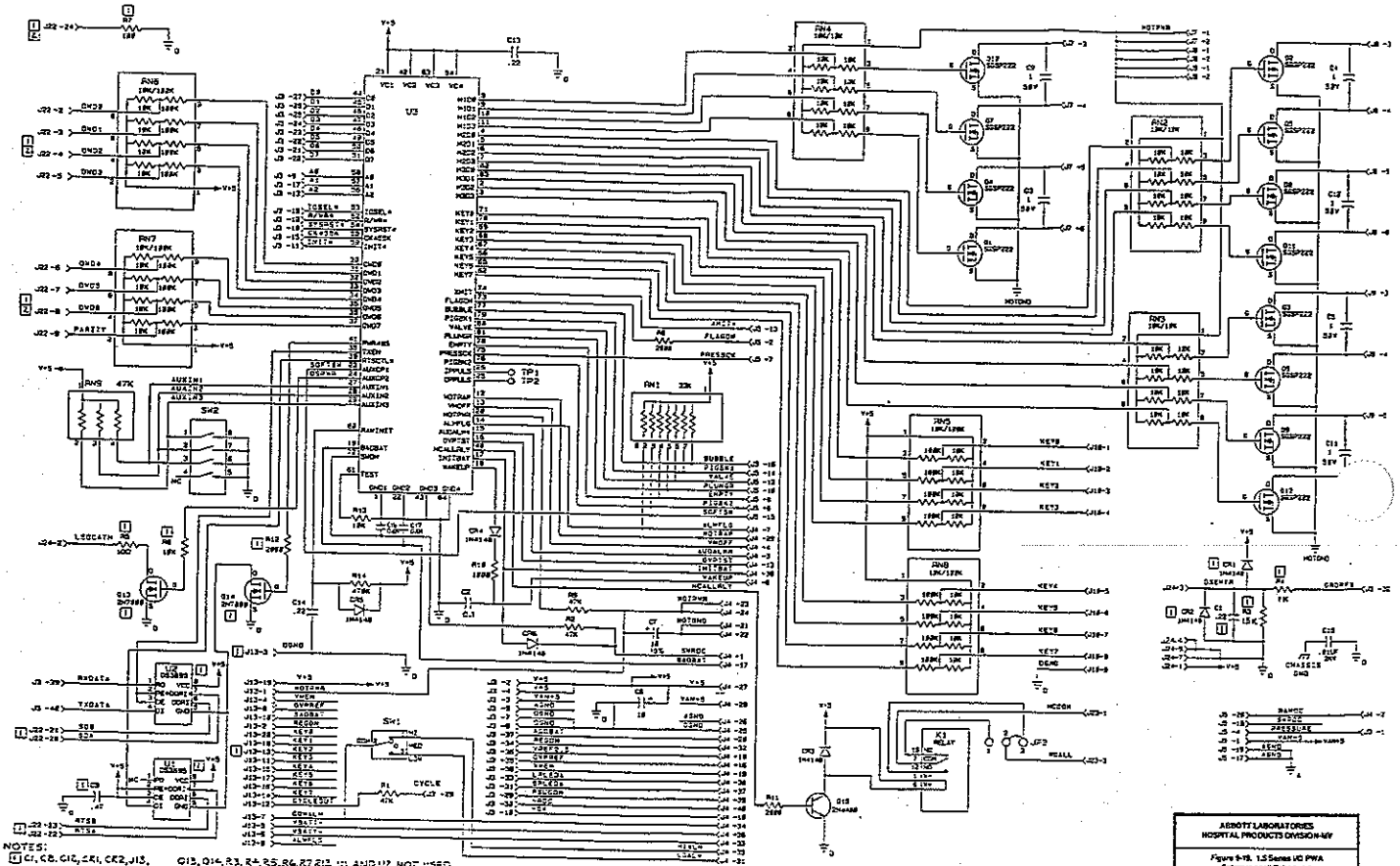
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/8W, 5%.

ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-MV	
Figure 9-17. T5 Series Main PWA (Interconnect Schematic)	
DRAWING NO. 348-03304-057	REV. M SHEET 1 OF 1



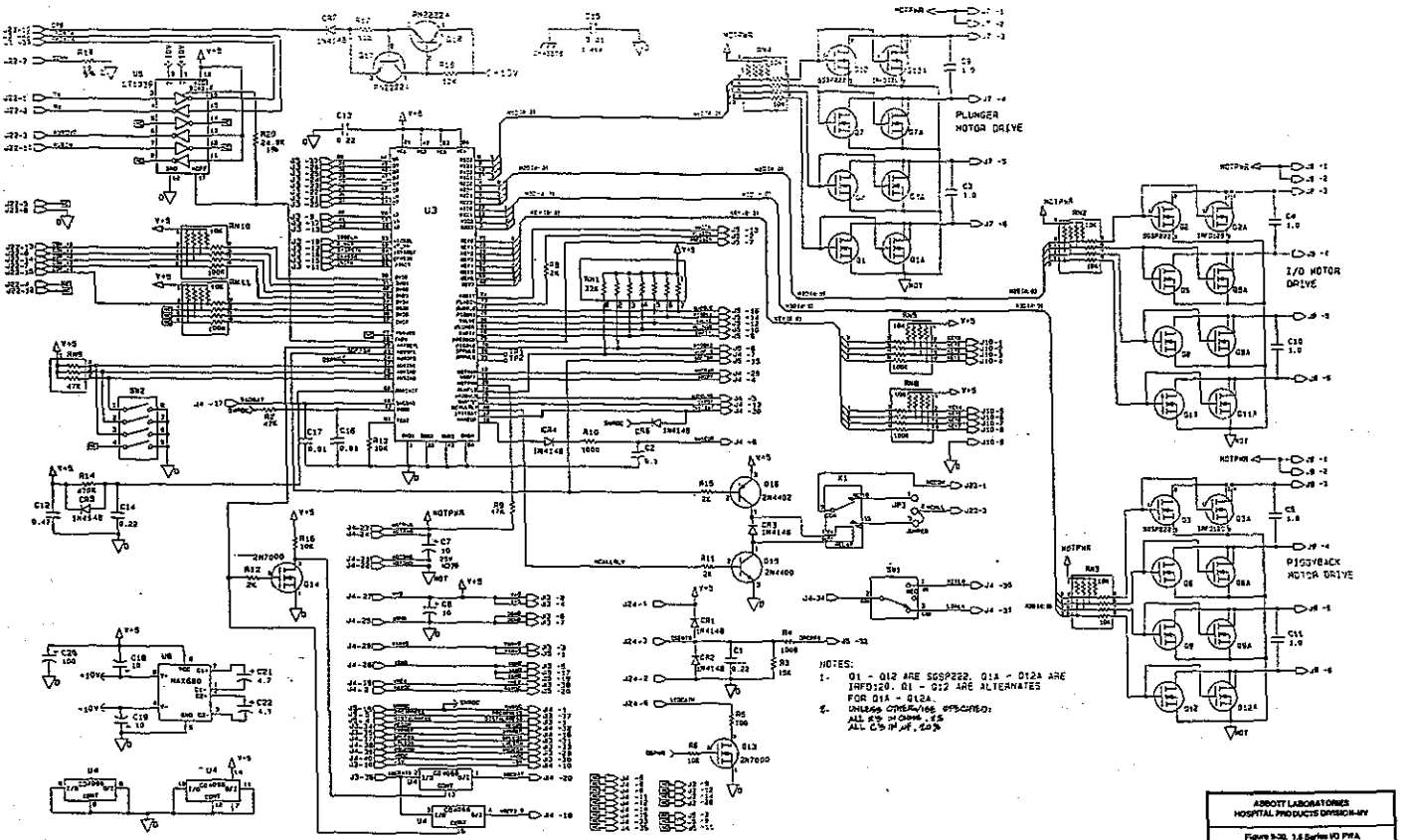
NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE 1/8W,5%
2. UNLESS OTHERWISE SPECIFIED, ALL CAPACITORS ARE IN UF.
3. [illegible] VCT USED

ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-MV	
Figure 9-19. 1.8 Series Main PWA (International) Schematic	
DRAWING NO.	REV. M
243-03304-052	SHEET 1 OF 1

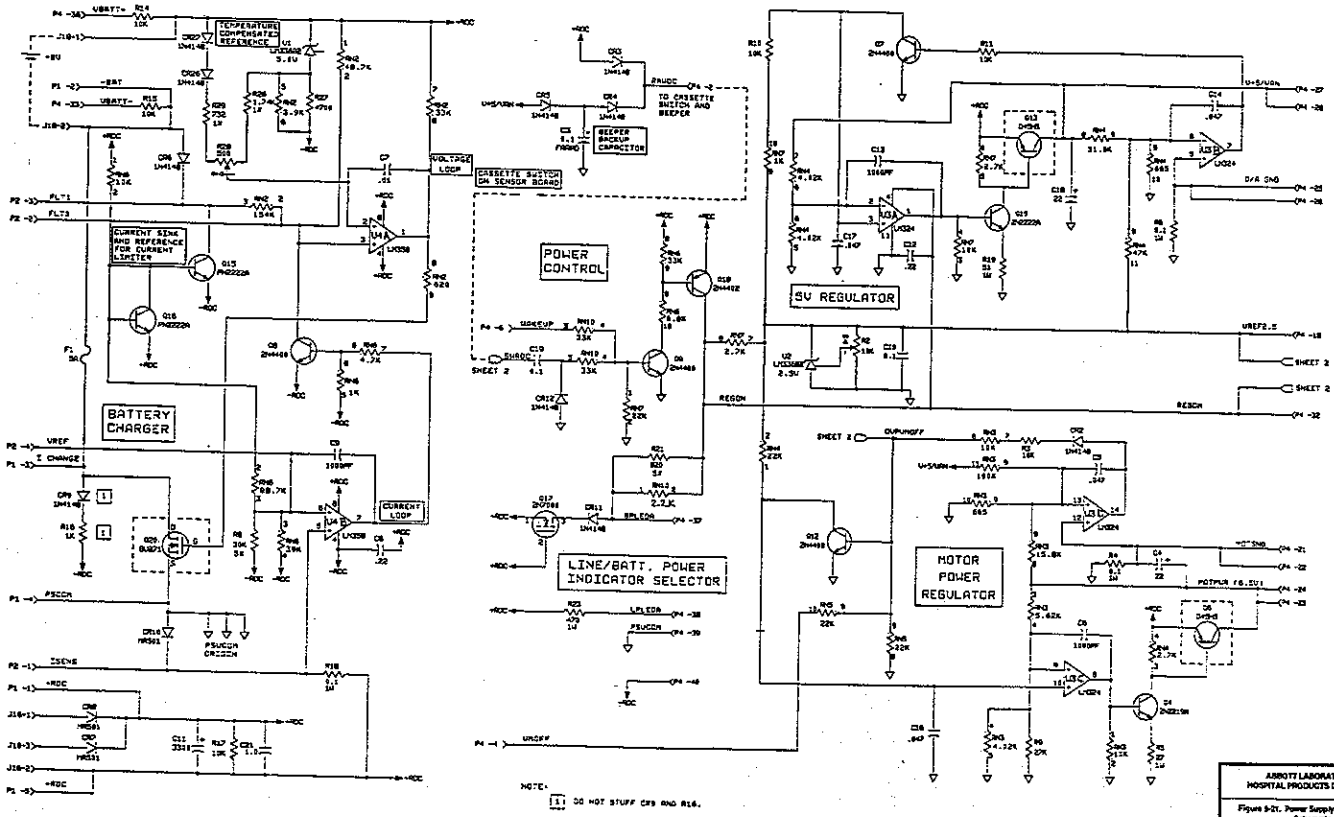


NOTES:
1. C1, C6, C12, CR1, CR2, J13, Q13, Q14, R3, R4, R5, R6, R7, R12, U1, AND U2 NOT USED.
2. UNLESS OTHERWISE SPECIFIED: ALL R'S IN OHMS, 0%
ALL C'S IN uF, 20%

ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-MV	
Figure 9-19. 1.5 Series I/O PWA Interconnect Schematic	
DRAWING NO.	REV. U
248-03305-021	SHEET 1 OF 1



ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IVY	
Figure 9-30. 1.5 Series I/O PWA [International] Schematic	
DRAWING NO.	REV. U
219-03309-022	SHEET 1 OF 1



ABBOTT LABORATORIES HOSPITAL PRODUCTS DIVISION-IMV	
Figure 9-21. Power Supply (International) Schematic	
DRAWING NO.	REV. T
349-03308-010	SHEET 1 OF 2